RAILROAD GAZETTE

FRIDAY, NOVEMBER 19.

American Society of Mechanical Engineers.

The arrangements for the seventh annual (fourteenth regular) meeting of this Society are set forth as follows in a circular issued by the local Committee of Arrangements, which is composed of Wm. H. Wiley, Chairman; F. R. Hutton, Secretary; James C. Bayles, Edward Weston, James A. Crouthers, Charles E. Emery, H. S. Hayward, Wm. Hewitt, Thomas Edison, Wm. Lee Church and Henry Morton:

The Seventh Annual Meeting of the American Society of Mechanical Engineers, will be held in the city of New York, beginning Monday evening, Nov. 29, and ending Friday, Dec. 3. This date has been chosen under the rules by the Council to suit the convenience of those who might wish to visit eastern homes for Thanksgiving, and who can then attend sessions on their way back. The opening session is put down for Monday to admit of most profitable use of time.

The sessions will be held in the hall of the New York Academy of Medicine, No. 12 West Thirty-first street, between Fifth avenue and Broadway. The headquarters of the Society will be at the convention rooms.

First Day, Monday, Nov. 29.—Opening session 8.30 p. m. This session of the annual meeting is that on which the President of the Society presents his annual address. Should time allow, there may be brief topical discussions. An early adjournment will give time for a supper in the lower room and social re-union of the members.

Second Day, Tuesday, Nov. 30.—10. a. m. Business session, reports of committees, reading of papers and discussions. 2. p. m. Reading of papers and discussions. In the evening the members are invited to attend the Fair of the American Institute at Sixty-third street and Third avenue. Complimentary tickets have been presented by the courtesy of the Board of Managers of the Institute and can be obtained at the session rooms.

Third Day, Wednesday, Dec. 1.—This day will be devoted to an excursion by boat to the city of Newark, N. J. Invitations have been given by Mr. Edward Weston, of the United States Electric Illuminating Co., to visit his private laboratory (one of the best equipped electric laboratories in the world), and also to visit other works of interest about Newark. Returning, the refineries of the Standard Oil Co., at Bayonne, will be visited, and a stop will be made at the Statue of Liberty on Bedloe's Island. A lunch will be served on the boat. Details of the time-table will be given at the sessions. In the evening a session will be held in the hall at 8 p. m., for the reading of papers and topical discussions.

Fourth Day, Thursday, Dec. 2.—The sessions of this day will be held at the Stevens Institute of Technology, in Hoboken, N. J. The use of the Institute buildings has been tendered by the President and Faculty for sessions at 10 a. m., and 3 p. m., and a lunch and reception at 1 p. m. has been tendered to the members present by President Henry Morton at his residence, adjoining the Institute buildings. Opportunity will be given to inspect the laboratories and collections during this visit. The professional sessions will adjourn at the close of this afternoon session, and the evening of Thursday will be left without assignment to admit of social engagements and attendance at places of amusement in the city.

Fifth Day, Friday, Dec. 3.—This will be devoted to an excursion to Trenton, N. J. A special train furnished by the Pennsylvania Railroad Co. will leave Jersey City. By the invitation and courtesy of Messrs. Cooper, Hewitt & Co., a visit will be paid to their wire mill and to the lower mill, and to points of interest at Trenton. A lunch will be tendered to the Society at Trenton by ther hosts, and the train will return to New York in time for the evening trains out of the city.

The following papers are to be presented and discussed at this meeting:

FRANCIS REULEAUX: "Friction of Toothed Gearing."
R. H. THURSTON: "Friction of the Non-condensing Steam Engine."
BENJAMIN BAKER: "The Working Stress of Iron and Steel."
A. WELLS ROBINSON: "Dredging Machinery."
ANDREW C. CAMPBELL: "A New Conicograph."
GAETANO LANZA: "Strength of Shafting Subject to both Twisting and Bending."
WM. KENT: "Heating Capacity of Water Gas."
GEO. I. ALDEN: "Formulæ and Tables for Calculating the Effect of Reciprocating Ports of High-Speed Engines."
WILLIAM COWLES: "Fire Boats."
GEO. H. BARRUS: "New Calorimeter."
OBERLIN SMITH: "Intrinsic Value of Special Tools."
W. E. PARTRIDGE: "Capital's Need of High-priced Labor."

Subjects and queries will also be presented for the topical discussions, which have proved so interesting and profitable at the recent meetings.

Master Mechanics' Association Circulars.

The following circulars have been issued by Secretary J. H. Setchel, from his office at Dunkirk, N. Y., under date of Nov. 2:

TRACTION INCREASERS.

The undersigned, a Committee appointed by the Master Mechanics' Association to investigate the various types of Traction Increasers and to report upon their relative merits, and the conditions under which their use can be recommended, respectfully ask that you will reply to the following questions:

1. Have you had any experience with devices for increasing the tractive power of locomotives?
2. Under what conditions would you advise the use of such a device?
3. What do you consider the best known arrangement for this purpose, and what is the cost of its application and maintenance?
4. Is there any good objection to utilizing the weight of the tank for this purpose?

Please address, R. H. BRIGGS, Chairman,
Argentine, Kansas.

PISTON-ROD, VALVE-STEM AND CYLINDER PACKING.

The undersigned, having been appointed a Committee for the purpose of obtaining information relative to the practice of master mechanics in regard to the use of Piston-Rod, Valve-Stem and Steam Cylinder Packing upon locomotives, respectfully solicit replies to the subjoined inquiries.

There is no part of the mechanism of the locomotive where so much loss in money value actually occurs as that incurred by the constant blowing away of steam, which must take place where imperfect or defective packing rings are employed, which not only escapes inert into the exhaust, but during part of the movement of the piston actually exercises a retarding influence upon the engine. It is, therefore, our plain duty to make the subject of packing rings an important and constant study, and to be willing to impart any special information to others for the general good.

In order to make a full report embodying the views of the membership, we request you to make replies to the following as early as may be possible:

Piston Packing.

1. Do you use cast-iron for packing rings?
2. What width of ring is your general practice?
3. What thickness of ring when first applied?
4. How much larger than the cylinder are the rings when first applied?
5. Do you, after turning the rings up, cut them, spring them in, clamp them and turn them to the correct diameter of the cylinder?
6. Do you make the ring heavier opposite to where it is cut open?
7. What is your usual plan for breaking joints?
8. Do you use springs to assist in getting the packing ring out, or depend upon the elasticity of the ring assisted by steam?
9. Do you use more than two rings in any of your engines?
10. Have you tried steel, phosphor-bronze, or gun-metal, and if so, please state results as far as thus tried?
11. Do you use Dunbar or any patented style of cast-iron packing rings? If so, please give name and address of patentee.
12. Do you use solid piston-heads and spring the rings into the grooves or follower and hub, T, or bull rings? Or, if both, state which you think preferable.
13. What is your general practice for adjusting the piston in the centre of the cylinder; do you turn the T ring out larger than the spider and line up with sheet-iron, or set screws, or clamp the T ring with the follower to hold the piston in centre of cylinder?
14. Do you drill small holes in the piston and follower to set out the packing?
15. How much side shake do you allow when rings are new, or do you make them close fit between the T ring and follower or piston?
16. What is your observation of the wear on cylinders incident to the use of steam packing, as compared with the old style of brass spring packing? Do you notice that the cylinders are worn away more rapidly near the ends, and do you regard this irregularity in the diameter to be any disadvantage in a packing which is flexible and automatic in its adjustment? How often do you think reboring necessary?
17. Do you permit the practice of peining the rings when worn to enlarge them or have you some special plan for enlarging them?
13. Do you use any special grade of cast iron for packing rings? If so, state character of metal.

Piston-rod and Valve-stem Packing.

1. Do you use hemp exclusively and in preference to other packing?
2. Do you use any of the prepared fibrous packings, and if so, what kinds and how do they compare?
3. Can you give an approximation to the cost of packing per 1,000 miles for pistons and valve stems with hemp or with any fibrous packing you may use?
4. Do you use any form of metallic packing for rods and stems? If so, please state kind and maker's name, or if your own design, please furnish a tracing or print of the device, giving particulars of cost of manufacture, and length of time or number of miles between renewals, also composition of metal.
5. Do you find it more difficult to keep metallic packing tight on valve stems than you do on piston rods? If so, please give your opinion of the cause.
6. Any special information not enumerated above will be gladly accepted by the Committee.

HENRY SCHLACKS,
ALLEN COOKE, } Committee.
J. W. STOKES,

Address all replies to J. W. Stokes, Pana, Illinois.

Contributions.

The West Shore Cinder.

STEELTON, Pa, Nov. 16, 1886.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to your illustration of "a large-sized cinder," in your issue of Nov. 12, I notice you have forgotten who picked up the "cinder" you illustrated, but I know some fingers that have not forgotten the searing they received at the time. GEO. W. PARSONS.

[We owe our correspondent an apology. It is two years ago, and to insure correctness we asked the gentleman who was accused of picking it up, just before publication, if he had done so, *and he said he did.* It appears, therefore, that two men's memories were treacherous.—EDITOR RAILROAD GAZETTE.]

The Continuous Frame Freight-Car Truck

The Westinghouse Air-Brake Company,
PITTSBURGH, Pa., Nov. 10, 1886.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have been interested in the standard continuous frame freight-car truck, with iron bolsters, adopted by the Boston & Albany Railroad, and illustrated in your number of Nov. 5. This truck possesses special advantages with reference to the use of the most perfect form of brake-gear, which will commend itself to all railroad people who have given that subject much attention; but it will be a great improvement if the brake-shoes are placed between instead of outside the wheels, as shown, because when placed inside, the action of one set of brake-shoes largely counterbalances the action of the other, in its effect upon the springs. With the diamond truck there is no convenient mode of attaching the brakes inside the wheels, except from the sand plank, where the vibrations are so great as to render the attachment of them somewhat insecure.

Without wishing to declare an opinion that this truck is in all respects a perfect one, I nevertheless wish to call attention to the fact that it does possess special advantages for the application of brakes; and also that it will admit of the substitution of larger wheels, which are sure to come into use in the near future.

The adoption of this plan for a truck by so important a road as the Boston & Albany, is evidence that in the judgment of the managers of that line it is one of superior merit; and if it should be found that it has no greater disadvantages than those of the diamond truck, now commonly used, the advantages I mention with reference to the use of the brake apparatus ought to make it the standard freight truck of the future.

I quite agree with your suggestion as to the substitution of iron brake-beams for those of wood. The flexibility of wooden brake-beams is a great objection to them when their important function is considered; and their liability to break into two or more parts while the train is in motion, and so cause a wreck, is another sufficient reason for discarding them. Theoretically, the brake-beam ought not to yield any more than the friction-block of the brake.

GEO. WESTINGHOUSE, JR.

Meeting of the American Institute of Mining Engineers.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The average St. Louis citizen probably reasoned in the following manner regarding our meeting at their city: "We have had the strike on the Gould system, we have also weathered a base-ball convention, the Triennial Assembly of Knights Templar, the procession of the Veiled Prophets, our own Exposition, and the absence of General Sherman, who left us because he couldn't wash his sidewalk *ad libitum*, and we certainly can stand the Mining Institute." Certainly St. Louis, so far as the Mining Engineers were concerned, followed Pooh-Bah's advice to the Lord High Executioner, and did it well.

The first business in order was an "informal" reception at the St. Louis Museum of Fine Arts, where an address of welcome was delivered by Mayor Francis, who told us how glad they were to see us, and what good fellows we were. Our Bostonian President responded in the cultured language of his home, and, as he always does, said the right thing. A treatise on Natural Gas, by Mr. Ashburner, of Pennsylvania (who appeared through the "intelligent compositor" before the public the next day as "Ashbummer"), opened the proceedings. As natural gas is the dream of all St. Louis people, and much money has been spent in the endeavor to find it here, Mr. Ashburner's remarks were full of interest to his St. Louis audience, especially that portion wherein he stated that the quantity flowing from the explored Pennsylvania sands was two or three times greater than the demand. Prof. W. B. Potter, of Washington University, St. Louis, showed what had been done in exploration for gas near St. Louis, and stated that Pittsfield, 50 miles northwest, had two wells from which that town derived its light and heat.

The next day business began in earnest, and the first regular paper of the session was presented by M. E. Walsh, Jr., on the Irregularities of the Blast Furnace Process and a Practical Way to Avoid Them. He illustrated his idea by comparing the various blast furnaces of note, showing sections of them, and offering his plan for a standard one, which in many features corresponded with the lines of the Clarence and Ormsby furnaces, especially at the bosshes.

Dr. Rossiter W. Raymond, the Secretary, then read his paper on "Indicative Plants," showing that certain varieties indicated certain formations below the surface. Thus, one plant indicated the presence of water, another salt springs, or iron ore, etc. This paper was extremely interesting and was discussed at length, many members supplementing Dr. Raymond's statements from their own experiences.

Succeeding Dr. Raymond came Mr. F. C. Blake, with a paper on the Use of Natural Gas in the Coal Blast Furnaces. The author is connected with the Pennsylvania Lead Co., of Pittsburgh, and contributed much valuable information to the Institute. Mr. Freeman then read a paper on the White Path Gold Belt of North Georgia, and a paper on the Diamond Mines of South Africa, by Gardner F. Williams followed, reviewing the history of the Kimberly and De Beer's mines, the annual production of the Kimberly being from $10,000,000 to $15,000,000. He touched on the practices of the natives in concealing the precious stones, stating that a hungry Kaffir would swallow 60 carats of diamonds. What effect this diet had upon the Kaffir, or whether the native had a basic lining in his converter, he failed to state.

Following this came two papers on an Improved Apparatus for the Manufacture of Sulphuric Acid, by W. W. Adams, and on Large *vs.* Small Charges at Warwick Furnace. The author decided that in furnaces of moderate dimensions the size of the charges has little or nothing to do with its working, and is only a convenience in filling. The gist of the next paper, on the Opening of a Chilled Hearth with the Coal-Oil Blow-Pipe, by R. H. Lee, Jr., of Lewiston, Pa., was that Mr. Lee opened the hearth by the aid of this blow-pipe in a quick and successful way. Prof. C. H. Hitchcock followed with a geological map of the United States, which met with Mr. Ashburner's approval.

The same night 65 applicants for membership were legislated into the Institute by the railroad process of the Society, viz., that the Secretary cast the entire ballot. It is true the names had been passed by the Council, but the method is a bad one, and serves to weaken the interest in the Institute. Numbers are not the only consideration to be taken into account in such bodies.

Prof. W. B. Potter, of Washington University, then made a most interesting lecture on Iron Mountain, its characteristics, the variety of the ore and its various positions, illustrated by colored charts and some excellent photographs. It was one of the features of the meeting. Next came a paper on the Condition of Silver in a Sample of Litharge, by Prof. C. E. Wait, of Rolla, Mo.: and the last paper read at the

session was that of Prof. B. W. Cheever, of the University of Michigan, on the Two Conditions of Phosphorus in Iron. A number of papers were read merely by title.

THE EXCURSIONS.

On Wednesday a jolly party assembled at the Iron Mountain Railroad station and at 7 a. m. (*mean* time) the train started for Iron Mountain and Pilot Knob on a schedule of 47 miles an hour. At Summit, 63 miles distant, the party were transferred to gondola cars with pine-board seats, for a short ride over the narrow-gauge road of the St. Joseph & Des Loges Co. This was a most charming trip, the day being all that could be desired, and the scenery lovely. The ties are laid as nearly on the original surface of the ground as was possible, and the road runs up and down hill with the greatest facility, and so do the cars on it. It answers the company's purpose, and is, so far, a success.

This St. Joseph Lead Co. works three mines. The ore is a galena associated with pyrite, and is worked to a depth of 250 ft. It requires considerable handling, as may be judged from the plant of one 800-ton mill for concentrating: eight 9×16 Blake crushers, eight 30×14 Cornish rolls, 8 rotary pumps for elevating, and 72 Parsons horizontal plunger jigs. The smelting plant is also very extensive. The working force consists of 700 men, and the annual capacity is 10,000 tons of lead and a small amount of cobalt and nickel matte.

The party then, after a "free lunch," mounted their pine boards on the gondolas, and started for Iron Mountain, which was reached in a short time. This hill is largely worked in open cuts, although we saw one incline and one shaft. Hydraulic mining is used on the surface ore and on the old dumps. Rock drills of the Rand pattern are used in many places, and the employés number about 300, while the capacity is about 200,000 tons. It was stated that 3½ million tons had already been mined. Leaving Iron Mountain, we passed at Middlebrook the branch running to the quarry of the Syenite Granite Co. and soon reached Pilot Knob. The deposit here is specular iron ore, 12 to 30 ft. thick. The mine has been opened at several levels, and is lighted by some 30 electric lights. It employes 700 men, and its annual capacity is 200,000 tons of Bessemer ore, averaging 0.021 per cent. of phosphorus.

The following day was devoted to the industries of St. Louis in the forenoon, and to its natural beauties of scenery in the afternoon. Prominent among the many industries is a comparatively new one, viz., making cathedral glass, and one party visited the works of the Mississippi Glass Co., where they were surprised at the economy shown in heating, and the fine manipulation of the product. The glass was of most beautiful colors, great taste being shown in the combination of colors and in the delicacy of tints.

The evening found the members at an elaborate banquet at the Southern Hotel. Everything was as usual, or perhaps it was more so. Banquets cannot be described; they must be partaken of.

On the morrow the "Spread Eagle" bore some 200 down the river to Crystal City, to see the glass rolled and then polished. The time passed rapidly, and on the return a most elaborate dinner was served on the boat; and dancing was enjoyed for a time. In the evening the St. Louis Club gave an informal gentlemen's reception, and the final act of the 46th meeting of the American Institute of Mining Engineers being completed, the curtain fell amid great applause.

The Burlington Tests of Train Resistance.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I read with a good deal of interest your editorial of Aug. 21 on train resistance as shown in the Burlington tests of train brakes.

I presume the data shown in diagram on page 590 was taken from the dynamometer's records while getting up speed for the brake tests. If this is the case, and the readings were taken at the different speeds shown, may not the different results shown be due to difference in the rate of acceleration of speed?

In the practical running of trains the resistance may be divided into four parts: 1, that due to friction to include friction of journal and bearings, flange friction, rolling friction (while in contact with rail), and any accidental rubbing of brakes against wheels; 2, that due grades; 3, that due to curves; 4, that due to the wind or atmospheric resistance.

In a series of experiments made by me with the dynamometer to ascertain how these different elements were divided, I found that between 2¾ and 3 pounds per ton would fairly represent the friction at from 12 to 15 miles per hour. Grade resistance is positive and exactly determinable. Curve resistance varied much with the alignment and elevation of the curves, varying from ¼ to ½ pound per ton for each degree of curvature at the same speed of 15 miles per hour. The air resistance was not very fully ascertained, as there are so many contingencies to be taken into account.

It is very plain that this resistance on a train of box cars would be double or quadruple that on a train of gondolas or flats of equal length, and also that that resistance does not vary whether the cars are loaded or empty. It will also vary with a head or quartering wind.

The force of the atmosphere is about ½ lb. per foot of flat surface exposed, at 10 miles per hour, the surface of resistance being at right angles with the current. This factor ½ pound will vary somewhat with the size of the surface exposed, but with surfaces the size of the end of a box car, say 60 to 70 square feet, it will be about correct. This would make the pressure against the first car 30 lbs. at 10 miles per hour, or $R = \frac{60}{2}$. For an increased velocity we have $R = S \times \frac{v^2}{2}$, S being surface in square feet exposed. But the resistance against each succeeding car would be diminished by the car ahead of it about half, we may assume, so that for the resistance of a train of 50 cars we have 49 × 15 ÷ 30, or 765 lbs. at 10 miles per hour, but this does not include the friction of the air against the sides of the train. On a flat car train the resistance would of course be much reduced, while a mixed train of flat and box cars would show a largely increased resistance. Again, cars running with the doors open would show greater resistance, especially with a quartering wind.

I attempted by an addition of an anemometer with the dynamometer to ascertain what that force would be at the various angles, but although I have the cards taken, I have never had time to analyze them.

In these remarks I have rather run away from the text but to make an application of it, I would say that in your report you do not show any data in regard to the wind and its direction, only in regard to the Westinghouse train, when you say it was a "dead calm."

In reference to the formula of $R = 4 + \frac{V^2}{181.5}$ per ton; that any such formula must be entirely unreliable for all classes of cars must be apparent.

With the Western practice of building cars to carry 20 tons and the better construction of cars and axles, the factor for friction per ton has been very much reduced, as shown, so that, instead of 8 lbs. to represent rolling friction, 3 lbs. is enough.

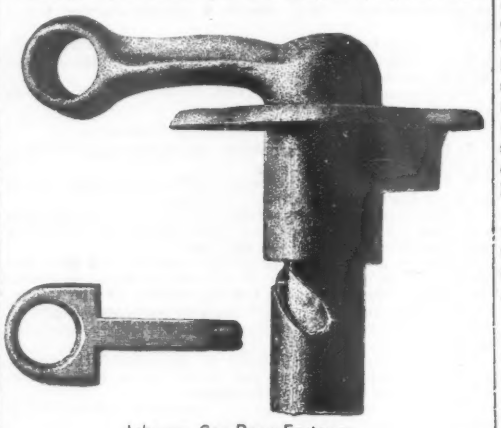
Of course, the trains used in the experiments at Burlington were not as well lubricated as they would have been if they were being run along on the road without stops, except such as are required by through freight service.

I would give as a formula for box car trains at a given velocity upon level tangents:

$$R = 3\ W + (15\ C + 15)\ \frac{v^2}{2}$$

R—Resistance.
C—No of cars.
V—Velocity unit, 10 miles per hour.
W—Weight of train.

The traction of a train of 50 cars of 1,600 tons gross weight would be, at 10 miles per hour, 4,800+765, or 5,565 lbs., and 4,800+4,685, or 9,485 for 35 miles per hour in a "dead calm," the resistance being increased or reduced in accordance with the direction and force of the wind.



Johnson Car Door Fastener.

It was very surprising that there should be so large a difference in the resistance of the same trains, as shown in the diagrams, but this is probably due to the bad adjustment of brakes, as it does not seem there could be so great a difference in the cars due to bad fitting journals, etc.

F. M. WILDER.

[Answering Mr. Wilder's suggestions in order, the train resistance or "gravity" tests were not based on dynamometer records at all, but on the very difference in the "rate of acceleration of speed" which he thinks may have been neglected. So much energy was in the train in starting, or communicated by the grade; so much remained in it at various points in the form of velocity. The difference is what was consumed by the train resistances. This method has the advantage of including engine and head resistance with that of the train, which is impossible with the dynamometer, and is likewise more accurate and positive.

The wind was so light in all the tests that its influence was probably inappreciable, and the formula to which objection is made $R = 4 + \frac{V^2}{181.5}$ was given only as the lowest, in each of its separate parts, for which any kind of authority could be produced, taking engine and car resistance together. This would give for a speed of

	10 m. per hr.	35 m. per hr.
Lbs per ton	4.55	10.72
For which our correspondent gives	3.49	8 86

The latter being for the cars only. The correspondence is close, but extending the formula of our correspondent to 50 miles per hour, we have a resistance for a fifty-car train, of only 4,800 + 19,125 = 14.95 lbs. per ton, which we fear is lower than could be realized in practice. The only true test is experiment. It has so far proved impossible to construct a formula which would hold water under all circumstances by analyzing the different elements of resistance. The differences between different trains at Burlington we believe were genuine, and not due to friction of brake-shoes against the wheels, for that was carefully looked after.—EDITOR RAILROAD GAZETTE.]

Johnson Car Door Fastener.

The device illustrated, manufactured by Walter Johnson & Co., of Detroit, Mich., had been introduced in a small way before the Chicago Railroad Exhibition of June, 1883, and was then awarded a medal, but in a quiet way it has since been making pretty rapid progress into favor, as the following lists indicate, showing the roads and number of cars on which it is in use:

Roads.	No. cars.
Michigan Central	13,000
Flint & Pere Marquette	2,180
Boston & Albany	650
Union Pacific	14,674
Wisconsin Central	1,548
St. Louis & San Francisco	100
"Bee Line" (D., C., C. & I.)	100
Detroit, Grand Haven & Milwaukee	250
Kansas City, Fort Scott & Gulf	200
Chicago & Grand Trunk	250
Total	32,052

In the field of fasteners this device is in a sense something of a "new departure," as the majority of fasteners are designed for the front edge of the door, while the Johnson is employed at the rear edge, thus doing away with many pins, chains, staples, hocks, etc., which are a source of expense, and often of annoyance. It will be seen to be compact in form, and is designed to be strong enough to withstand any sort of usage, being made of malleable iron and having no loose parts to become detached and lost. It weighs in all about 2 lbs.

In substance, the fastener is a bolt which passes through the door, near the rear edge, projecting 1½ in. on the inside, and preventing the opening of the door by impinging upon the rear door-post. This bolt is 3½ in. in length and 1 in. in diameter, around which is a spiral slot, and having a handle 3½ in. in length. At the end of the handle is an eye for the reception of a lock, or sealing-wires, or both.

The bolt is attached to the door by means of a collar, shown in the engraving, corresponding with the thickness of the door, and with a flange for attachment to the outer surface of the door, through which are two holes for rivets. A wrought-iron pin, passing through the collar and projecting into the spiral slot referred to, retains the bolt within the collar and furnishes the means for inserting and withdrawing the bolt (fastening and unfastening the door). A pin bearing an eye, shown separately in the engraving, is riveted on the inside of door, the eye being on the outside. To this the handle can be locked or sealed, completing the fastener.

When the door is fastened the handle is left hanging downward, and its weight keeps it in that position. To unfasten the door, the handle is given a three-quarter turn upward and to the right, in which position it is again held by its weight. Among the merits claimed for it are:

It is easily applied to any sliding door, upon old cars as well as new; it is wholly upon the door, and sealing-wires cannot be subjected to strain or chafing; it is operated easily and rapidly; there are no parts to be broken or lost; any number of seals can be used, as the eyes for their reception are ½ in. in diameter—a point of much importance in bonded cars passing the frontiers, as it frequently happens that when customs officers do not find a place for government seals they make a place by tearing off a railroad company seal. Moreover, there being no danger of breakage, there is no necessity whatever of "cleating" a car equipped with it. Finally, the fastening is, we are informed, quite cheap.

Alabama Railroad Commission.

We have received the following extracts from the forthcoming report of the Railroad Commissioners of Alabama:

We herewith give for public information a list of the several applications made to the office of the Secretary of State for railroad charters since our term of office commenced:

Jacksonville & Montgomery; Jacksonville & Carrollton; West Florida & Alabama Southern; Tuscaloosa, Mineral & Great Northern; Eufaula Southern; Portersville, Bayou la Batre & Fernland; Sheffield Terminal; Montgomery & Florida; Birmingham & Memphis; Pensacola & Memphis; Columbus & Montgomery; Goodwater & Birmingham; Jacksonville, Gadsden & Attalla; Baltimore, Birmingham & Gulf; Alabama & Tennessee; Florence & St. Joseph; West Alabama Short Line; Eufaula & St. Andrews Bay. The numerous applications for charters for railroads, as shown above, gives evidence of confidence in future prosperity, as it will be seen that the proposed lines are to penetrate and traverse almost every part of the state. This is but the outward evidence of the inward feeling of hope and confidence in a splendid state development, gratifying alike in the highest degree to all of our people and to the friends of the state.

The following named railroad companies have organized under the law, having paid in their first installments of money and elected their several boards of directors preliminary to the commencement of work:

Montgomery & Florida; Alabama Diagonal; Sheffield Terminal; Memphis & Birmingham; Pensacola & Memphis Alabama & Tennessee.

We have also embraced in this report copies of a few decisions of the Board in settlement of complaints against railroad companies, and also of those submitted by railroad companies as would in our judgment tend to show the working of a system of railroad transportation in Alabama, and the effect of the law as a feature of regulation applied thereto.

Numerous complaints have been filed with us, coming in the main from shippers and others having business relations with the railroads, the adjustment and settlement of which we have in most cases accomplished, either by correspondence or personal conference with the general managers or other officers of the roads complained of, without the necessity of prolonged, expensive and formal trials. No important principles of law were involved in these complaints, but they were generally issues arising out of misunderstandings between the agents of the companies and the shipper, or through some oversight, neglect or mistake of the agent.

The evidence everywhere to be seen of the growth and development of our state, and its business industries give promise of a better and more prosperous future. We think

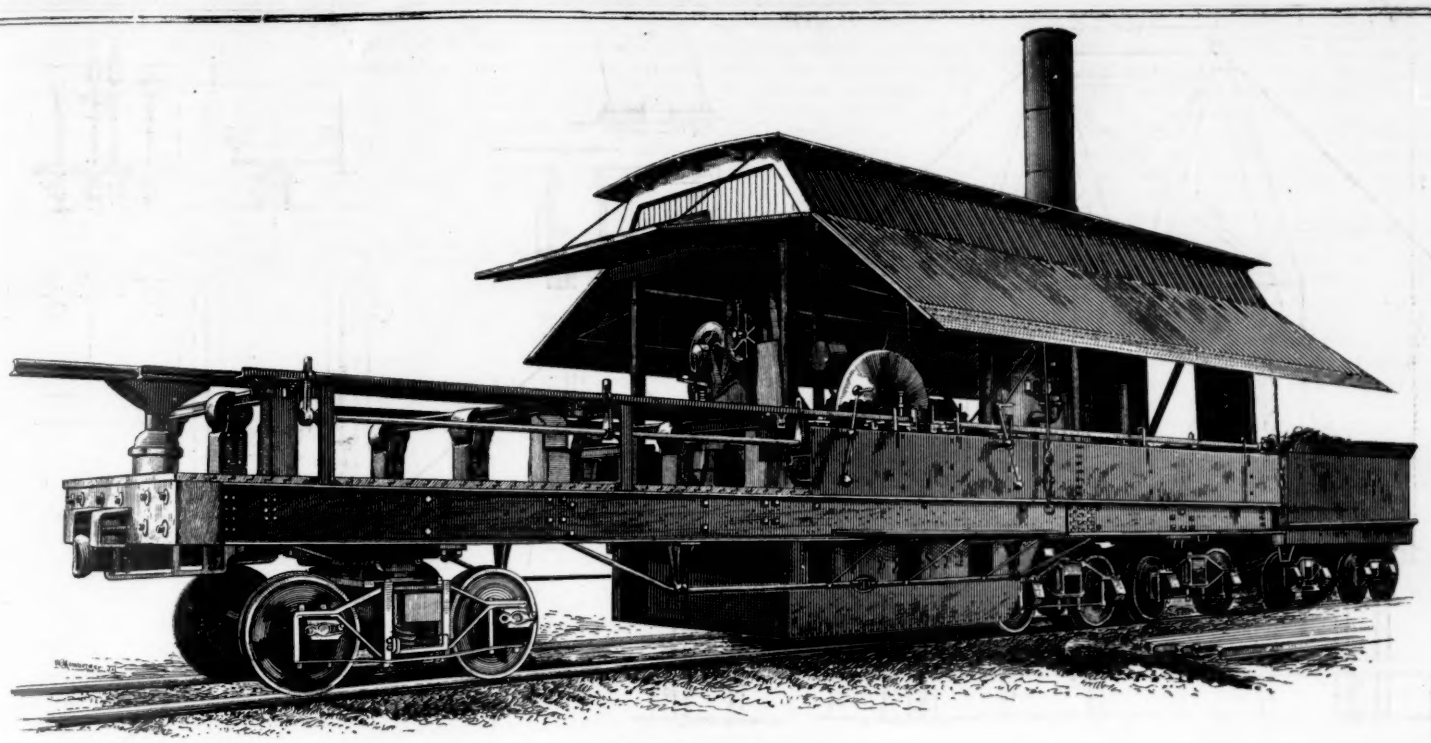


Fig. 1.—Perspective View.

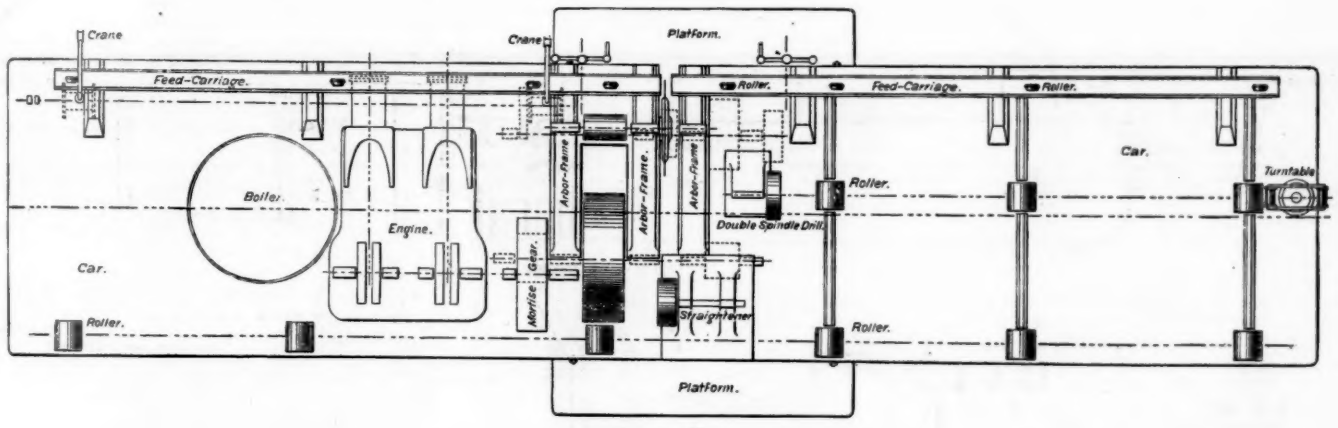


Fig. 2.—Plan.

RAIL SAW FOR MICHIGAN CENTRAL RAILROAD.

Designed and built by INDUSTRIAL WORKS, *Bay City, Mich.*

the railroad prospects of the state are brighter than they have ever been. During the past two years the great number of applications for charters, and charters actually issued to corporations that have organized in accordance with our statutes, gives unmistakeable evidence of the confidence of capitalists of the country in the future of our state, and in the wisdom and integrity of our laws for the protection of property. Investments of foreign capital are now being made all over the state, showing confidence in our growing development and wealth. Our official relations with the railroad companies of Alabama have been pleasant. They have made no issues with us as to our jurisdiction, and have not in a single instance refused a compliance with any recommendation made to them in writing as to the adjudgment of the Commission. They have manifested a respectful recognition of the dignity and power of the state. In a few isolated cases there was some delay in making changes in the mode of operating the road, and conducting its business, after receipt of written notice of the changes adjudged to be reasonable and expedient, but in every such case an immediate compliance was promptly made upon advice of the counsel and legal adviser to the officer or agent to whom such notice had been given.

The railroad officials, as well as the shareholders of the corporations, have accepted, in good faith, the institution of the Railroad Commission as a department of the state government, and respect it accordingly.

Portable Steel Rail Saw—Michigan Central Railroad.

The question was asked some three years ago by Mr. J. M. Toucey, of the New York Central & Hudson River Railroad, why a portable steel rail saw had not been designed which would cut off the battered ends of steel rails, re-drill and straighten them, and thus save the expense of transportation on long lines of road to a stationary plant.

At a later date the President of the Michigan Central Railroad made inquiries as to a machine that could be used in cutting off the battered ends of some English rails laid on the Canada Division of his road. The Industrial Works, of Bay City, Michigan, who have done some other highly creditable work in designing special machinery, were requested to look into the matter, and finally submitted a design for a portable steel rail saw to Mr. J. D. Hawks, Chief Engineer of the road, which is illustrated in the accompanying engraving. The design was approved, and a guarantee was made by the Industrial Works that the machine would cut 100 rails at both ends, and re-drill and straighten them, in ten hours. It was from the first a great success, and is now cutting from 275 to 300 per day.

The machine was constructed, and delivered to the Michigan Central Railroad about March 1, 1886, and has been in almost constant operation ever since, with little breakage or delay. The following is a copy of the work performed by the machine during the past three months, as furnished by Mr. Hawks:

RECORD OF RAIL SAW FOR JULY, AUGUST AND SEPTEMBER.

July.		August.		September.	
1 Holiday	17 310	1 Sunday	17 444	1 412 ends	16 470
2 352 ends	18 Sunday	2 300 ends	18 4 4	2 380	17 480
3 230	19 450	3 350	19 202	3 410	18 420
4 Sunday	20 380	4 222	20 160	4 350	19 Sunday
5 264	21 374	5 360	21 320	5 Sunday	20 300
6 Not running	22 378	6 324	22 Sunday	6 440	21 None
7 352	23 382	7 200	23 427	7 390	22 540
8 310	24 352	8 Sunday	24 434	8 400	23 400
9 350	25 Sunday	9 404	25 380	9 500	24 140
10 400	26 400	10 270	26 450	10 420	25 None
11 Sunday	27 328	11 420	27 442	11 320	26 Sunday
12 264	28 384	12 420	28 450	12 Sunday	27 240
13 350	29 410	13 Not running	29 Sunday	13 470	28 506
14 370	30 342	14 380	30 290	14 550	29 364
15 380	31 570	15 Sunday	31 446	15 520	30 500
16 400		16 306			
Average, 361 cuts. 180 rails.		Average, 366 cuts. 180 rails.		Average, 372 cuts. 186 rails.	

All rails were re-drilled and when necessary straightened. The average is for working days only, and the machine is now, as we say, working up to 300 rails (600 cuts) per day.

The machine, therefore, which is now in operation at St. Thomas, Canada, may be said to have simply demonstrated the practicability of the portable plant. About 20 miles of re-cut steel has been relaid.

The problem in the design of this machine was one of capacity. For if the necessary speeds, requiring accurate alignment of shafting, gearing and belting, were practicable on a car at all, there should be also an arrangement of mechanism as to give ease in handling and transferring rails from one operation to another, and cause no interference. Every movement should be done by the power of the engine, to insure rapidity.

The mechanical arrangement of the machinery is shown in the accompanying plan. In operation, the rail is hoisted at both ends by two cranes and deposited on the feed carriage. The rail is clamped to the carriage, and fed to the saw by the operator on the platform. This operation cuts one end, and to cut the other, the rail is simply run through on the rollers of the other carriage until in proper position for cutting the other end. While this operation is being performed another rail is hoisted by the cranes preparatory to cutting its first end.

After both ends are cut, it is run on the skidways to the line of the double-spindle drill, and when drilled at one end, the turn-table reverses its position, and the other end is drilled.

If the rail is straight, the operations are now complete; otherwise it goes to the straightaner, and thence to the ground or cars.

To operate this mechanism a high-speed double cylinder engine with 223 indicated horse-power is used. Some high speed gearing transmits the power from the engine to a countershaft, to which the pullies of the saw arbor, the double spindle drill, and the rail straightener are belted. This gearing has a speed at the periphery of 2,500 ft. per minute. Both gear and pinion are accurately balanced, and the form of the teeth carefully cut. A belt 16 in. wide drives the arbor pulley, and has a speed of about 6,500 ft. per minute. The most successful fusion discs have a speed at the periphery of about 2,500 ft. per minute, and with this speed, a steel rail weighing 65 lbs. per yard has frequently been cut off in 15 seconds.

Every revolving part of the machine is balanced, otherwise no such speeds could be attained on a car.

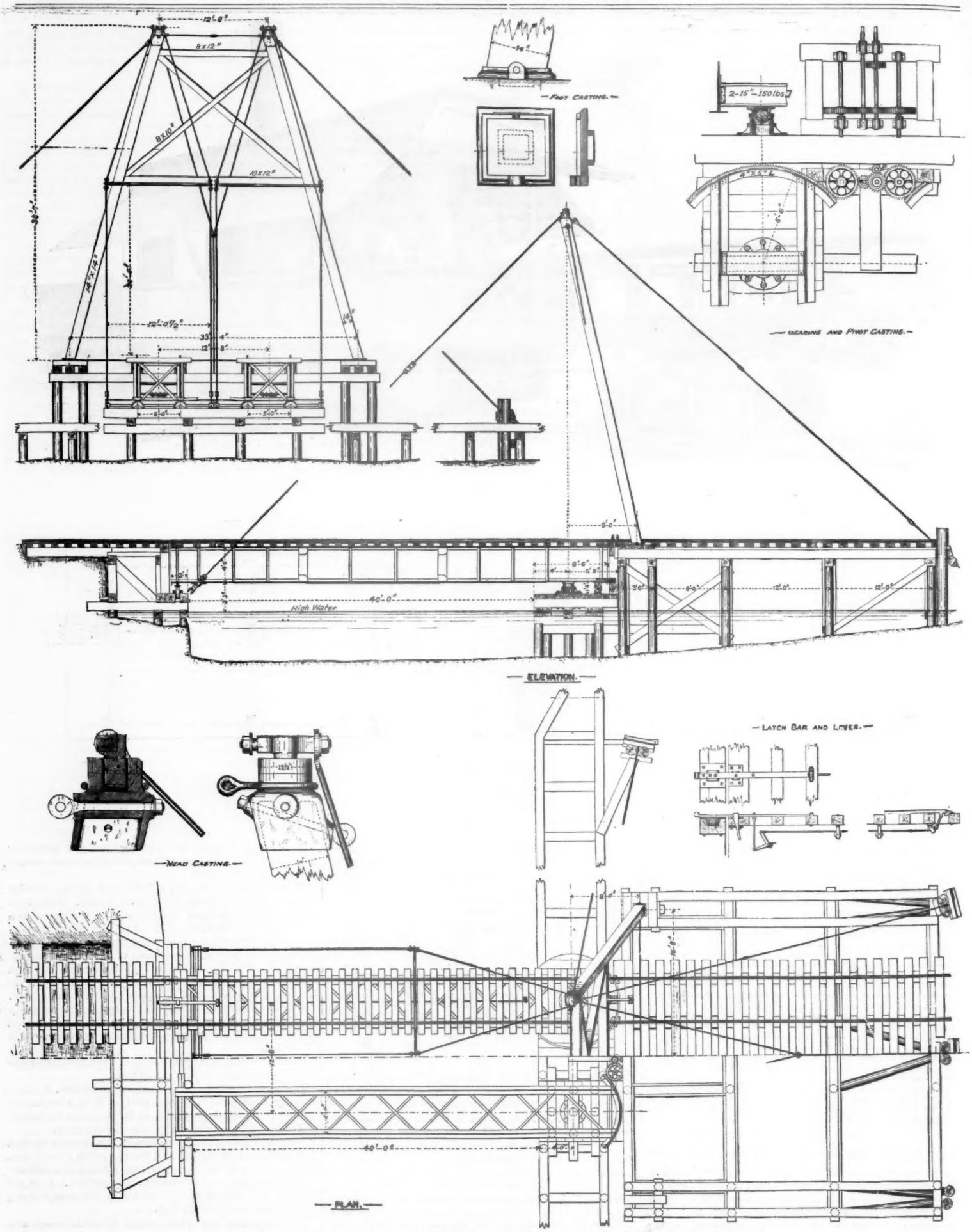
The base to which the mechanism is secured, is a most strongly constructed iron car, made of 15 in. I-beams and channels. An equal distribution of the weight on the heavier end of the car is accomplished by an equalizer truck.

The feature of portability secured by this machine makes a large saving in the expenses of transportation of rails long distances, and it may be used on one division of a road, accomplish its work, and be transferred to another. It is not intended nor desired to be portable in the sense of being moved a mile or two every day.

For the maintenance of tracks many devices have been used at different times. The shop fixture for patching rails, by upsetting or otherwise, is now condemned. The operation was expensive and unreliable even for iron rails, and is not well adapted to steel. As an advancement, which resulted in perhaps the first rail saw used for the maintenance of tracks in the United States, Mr. J. T. Clarke, of the Chicago, Milwaukee & St. Paul, adopted and used successfully a peg-toothed saw, which required the rails to be heated before the operation of sawing.

Still later, with the developement in England of the capabilities of the fusion disc, its adaptability to track work was acknowledged, and several of the largest railroads in the United States have erected a stationary rail sawing mill, using the cold saw. The idea is to erect a plant at some central point on a line of road, and bring the battered rails to this point for cutting.

The portable saw as shown above, from its compactness of



DOUBLE-TRACK ONE-ARMED DRAW-BRIDGE, STATEN ISLAND RAPID TRANSIT RAILROAD.

ALFRED P. BOLLER, *Engineer.*

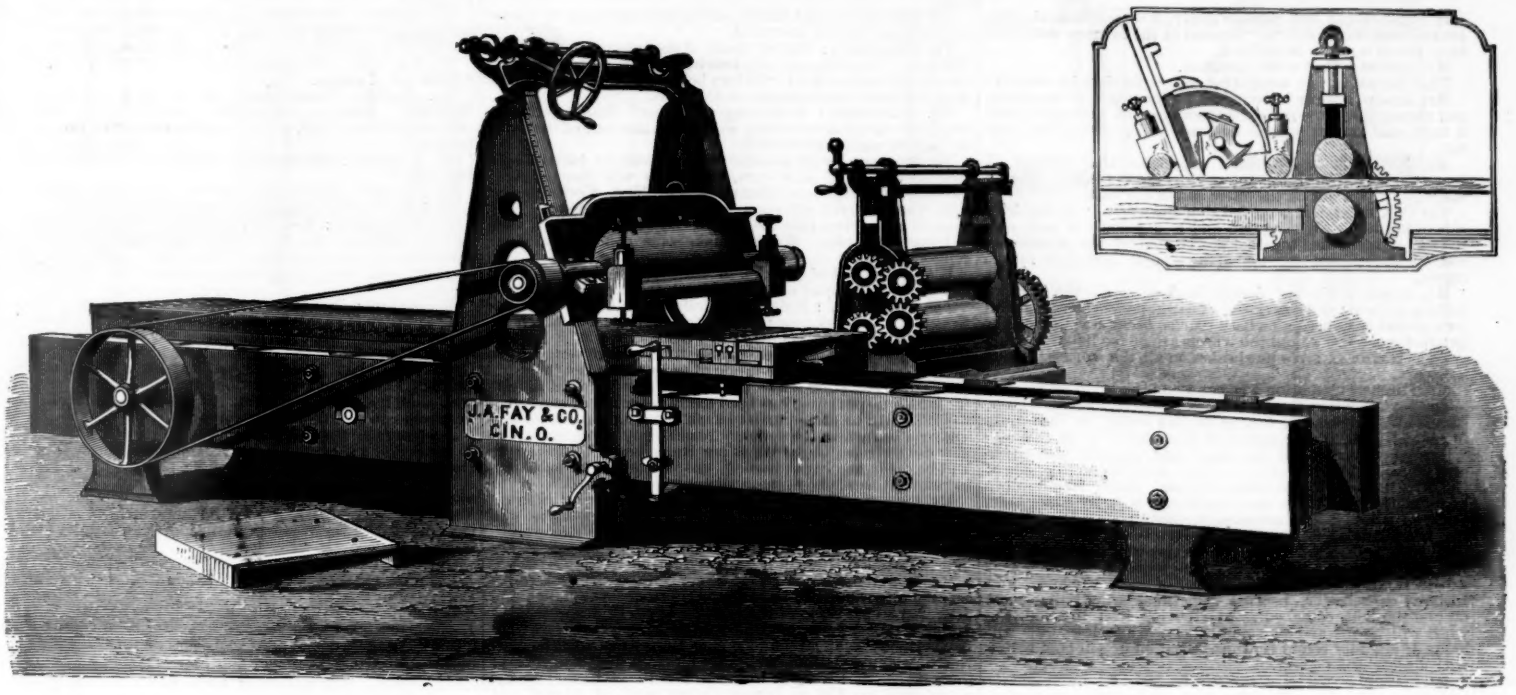
parts, its higher speed and more direct application of power to the saw arbor than is attained in a stationary plant, is cheaper, has accomplished more work than any other of which we have record, and saves long transportation of rails. Mr. J. D. Hawks, who was largely instrumental in bringing about the construction of the machine, and who has carefully looked after its working since, is more than pleased with it, and speaks in the highest terms of its practical value.

Double-Track One-Armed Draw.

In these days of great bridges, small ones are apt to be passed over as not worthy of study, and yet the great multitude of bridges are small ones, and in the aggregate they are yet far more important, as respects good design of details, than their larger congeners. This is more particularly true of draw-bridges—a nuisance at best, and more or less of an anxiety to any railroad that is forced to use them. On the coast and along the lakes of the United States are multitudes of small waterways crossed by railroads that must be kept open, even if used only by a single daily oyster shallop. Such openings run all the way from 15 to 40 ft., and have called into existence a class of cheap draw-bridges, composed essentially of a pair of girders, pivoted at one end and supported at the other by means of rods attached to shear-poles or other frame work, spread for passage of trains and guyed back to the permanent work on the pivot side of the girders. In many if not in most of these bridges the girders fold back on each other (hence the term "jack-knife draws"), which prevents the use of diagonal and lateral and transverse bracing, or of cross-ties—hence a lack of unity and rigidity ensues, dangerous to high speeds.

In all such bridges, the end thrust on the lower pivot and the cross pull on the upper pivot are very great, and numberless devices have been tried "to reduce" the friction and ease up the working of the draw, with varying success. There are very few but require a good deal of tinkering or which get along with less than two men to operate them, if of any size.

The design illustrated in this number of the *Railroad*



COMBINATION DIMENSION PLANING MACHINE.
Made by J. A. FAY & Co., *Cincinnati, Ohio.*

Gazette is intended to obviate these difficulties by affording an easily worked and simply detailed double-track draw for a 40 ft. waterway which shall be well braced and durable. It was designed and built by Alfred P. Boller, of New York, for the Rapid Transit Railroad Co., at Port Richmond, Staten Island. It is easily operated by one man, and the parts were designed with the particular purpose of reducing friction and repairs to a minimum. The girders are in pairs under each track, each pair being braced together with the usual diagonal bracing, the track being supported on cross-ties. The pivot end of the girders consists of a hemispherical cast-iron pivot 8 in. diameter, while the upper pivot, to which the rods supporting the free ends of the girders are attached, is of wrought iron 5 in. diameter, forged with a cross-head. This pivot bears against the sides and bottom of a brass-lined cast-iron socket, securely fitted to the heads of the shear-poles, to which castings the anchor guys are attached.

The operating pinion is in the centre between the tracks, and throws either wing out to the left and right respectively by means of the gears and rack segments attached to the ends of the girders. The free ends come up on a pair of sheaves attached to the permanent work, and the tracks are locked by an ordinary lever device, operated by the draw tender, near the turning handle. The permanent work is all wood, the pivot piles and platforms having been put in with the greatest accuracy, and securely braced to the approach trestle and the up-and-down fenders. The anchor piles are of oak, driven as shown, and so spurred into the permanent work as to produce no appreciable cross-bending on the piles.

It is of the utmost importance in bridges of this character that the axis of the upper and lower pivots should be maintained in its true vertical relation, during all positions of the girders, which can only be done through an unyielding permanent work, which, when of wood, must be effectively braced in all directions and no false economy practiced in saving a few piles. This seems to have been the aim in designing this structure, the drawings of whichare so complete that any more detailed description seems hardly necessary.

Fay's Combination Dimension Planing Machine.

The accompanying illustrations represent a combination dimension planing machine lately introduced by Messrs. J. A. Fay & Co., of Cincinnati.

This machine is a combination of the Daniels and Woodworth planing machines, and can be quickly changed from one method of planing to the other. It is made to plane 24 in. or 30 in. wide, as may be wanted, is particularly well adapted for planing out of wind, surfacing, etc., as the surface produced is similar to that of the ordinary surface planer, and perfect enough to be used for glue jointing.

The cylinder is lipped with steel, carries three knives, and runs in long patent self-oiling bearings, and the parts most liable to wear are constructed of iron and steel. It is supported in its frame upon two standards having planed surfaces, upon which it is gibbed and moved vertically, and at an angle, to retain the belts at the same tension. The cylinder frame is elevated by two screws, by means of a hand wheel. There is a pressure roller each side of the cylinder, which holds the lumber solidly to the platen, or they can be lifted up so that there will be no pressure, when planing dimension stuff or lumber out of wind.

The machine when fitted with the feed roller attachment for surface dressing, embodies the essential peculiarities of the Woodworth surfacing machine. The makers state that it will plane out of wind three times as fast as the Daniels planer. The machine is constructed to suit any length of stuff which it is desired to work, and the cylinder has a vertical adjustment, sufficient to allow stuff up to 24 in. hick to be dressed out of wind. The platen is furnished with the necessary dogging apparatus for securely holding the stuff, so that with one motion it is firmly secured to the platen.

The feed-rolls, when not in use, are quickly moved back out of the way on planed slides. The rolls are connected by expansion gearing, and take in lumber up to 4 in. in thickness; when used for surface planing, the table is placed with its end under the cylinder and pressure-rollers, and has a heavy plate for lumber to pass over as it is being planed.

The feed works for the platen have two changes of speeds, and the machine is so arranged as to surface while the platen moves either forward or backward. The friction reversing lever for the return movement is in the most convenient position for the operator.

The feed works are protected from dust, and all the bearings arranged with large oil cavities to insure perfect lubrication. The machine is made throughout in a very durable and substantial manner. Two classes of this machine are made, for heavy and light work.

Railroad Supplies for the Union Pacific.

The Union Pacific Company, as is well known, has for several years adopted the plan of asking for bids from manufacturers and dealers for the supplies used in the operation of its road. This plan has worked so well that it is to be continued, and the advertisement calling for tenders for next year's supplies has already appeared in our columns. As a matter of interest, showing the great variety of articles required on a railroad, we reproduce below the list of articles which the company expects to need during the year; the list does not differ essentially from that which would be furnished by any other road of large mileage:

The Union Pacific Railway Co. invites tenders for its whole supply of the following articles for one year, deliveries to begin Jan. 1, 1887, or before, at its option:

Axles, steel, as per specification No. 209.
Brass and brasses, locomotive and car.
Babbitt, as per specification No. 231.
Barrows and trucks, all kinds.
Belting, leather.
Brick—common, fire and pressed, engine and cupola arch.
Brooms.
Brushes, paint, all kinds.
Candles, coach.
Castings for Kansas Division.
Castings for Kansas Central.
Cement—Portland, Utica, Kansas, Louisville, Milwaukee.
Clay, fire.
Crucibles.
Copper—ingot, sheet and bar.
Dry goods, as per list to be furnished on application.
Files.
Frogs and Head-chairs, as per blue-print furnished on application.
Forgings, Iron and Steel.
Flues, Boiler, as per specification No. 207.
Fittings, Pipe and Steam.
Grenades, Hand Fire.
Glass—Common, Plate, American and French, Embossed, and Mirrors.
Handles, Tool.
Headlights, U. P. Standard; blue-prints furnished on application.
Injectors, for Locomotive and Stationary Boilers.
Iron—Stay Bolt, Common Bar and Sheet, and Russia Sheet.
Leather—Harness, Sole and Lace.
Lighting Material.
Links and Pins, Coupling, as per specifications Nos. 212 and 213.
Locks, all kinds.
Lubricators, Sight Feed.
Lumber—Oak, Colorado Pine and Oregon Fir.
Netting, Steel Wire
Packing, Miller's Soapstone.
Piling—Oak, Pine, Cedar and Fir, as per specification No. 227.
Pipe—Iron, Wrought and Cast.
Posts—Oak and Cedar, Fence and Stockyard.
Rivets—Burden's Boiler and Tank.
Roofing—Car and Building, Galvanized and Corrugated Iron.
Rope—Manilla and Wire.
Rubber Goods—Hose, Belting, Packing, etc.
Sandpaper.
Scales—Track, Platform, Counter, Letter, Steelyards.
Saws, all kinds.
Steel, Bar and Sheet.
Screws, Wood and Lag.
Springs, Steel, Car and Locomotive.
Switch Stands.
Soap.
Solder, Tinner's, half-and-half.
Ties, Bridge and Switch, Oak.
Tiling and Sewer Pipe, all sizes and weights.
Tires, Locomotive, Steel.
Tinware, as per list, to be furnished on application.
Tools, Track and Shop.
Tubing, Copper and Brass.
Weather Strips, Metalic.

When possible, samples of material offered should accompany tenders. When this is not practicable, some graphic representation of articles in question should always be sent with bid.

Axles, Babbitt, boiler flues, links and pins, piling and gas-pipes must conform to company's printed specifications. All other material to be subject to such inspection and tests as the company may require.

The New England Railroad Club on the Intercharge Rules.

At the regular meeting of the New England Railroad Club, Nov. 10, Vice-President Lauder presided, and 65 members present. The discussion of the Interchange Rules was continued.

It was voted, as the sense of the meeting, that that portion of the 11th clause of an unofficial interpretation of the rules recently prepared to assist inspectors, reading as follows, "or when brake shoes are worn down to bolt head or key bolt (when head and shoe are combined), they shall be considered worn out and rejected," should be stricken out.

The CHAIRMAN: The first part of Clause 14 is as follows: "Brake beam fulcrums (cast iron) secured by 2 bolts and nuts to brake beam, when casting is cracked, reject."

Mr. SOULE: Nuts holding the bolts of the lever are often cracked, leaving the bolts and castings intact, and such cracks do not affect the safety of the car sufficiently to throw it out, when loaded.

Mr. ADAMS: A new one can be put in in five minutes.

Mr. SOULE: There is but a small space there for a man to work. With inside brakes on, a man has to lie on the track and reach up behind; and I wouldn't care to send a man under a train to do that work, and besides it entails delay.

Mr. ADAMS: The fulcrum might be in a safe condition, but I am in favor of having everything sound. I don't believe in broken irons of any description.

Mr. CHAMBERLAIN: I think if that is cracked through there (illustrating), the fulcrum would be affected, and the tendency would be to loosen the bolts and crack the iron where the bolt-hole is. Such cars, if passed, would never be repaired, some rod would finally pull out, and a new casting must be put in.

Mr. ADAMS: A broken iron is weakened. We should keep the cars in the best possible order, and not to allow cars to run which are not in good order. This idea of stopping freight and blocking the way has been a great bugbear with many people, but the general officers believe that it is of the first importance to have our cars in good order and sound condition; and that this will facilitate the movement of freight very largely; but if we leave them at loose ends, and let this and that and the other thing go, we are entailing upon the transportation department those difficulties which obstruct the rapid movement of cars.

Mr. BLACKALL moved that the portion of Clause 14 under discussion should be stricken out. Defeated.

The CHAIRMAN: "The remainder of Clause 14 is as follows: Wrought iron fulcrum to be secured by nut lock or jam nut."

Mr. SOULE: Suppose a car came along with one nut on?

Mr. ADAMS: It is a short job to replace these nuts. A man can put on one in half a minute.

The CHAIRMAN: Clause 15 is as follows: "Brake connection (lower) secured to brake beam with one nut each side of beam, secured to brake lever with key bolt and key (upper) secured to lever with either hook or key bolt and key, and to chain connection by hook. Inside brakes, the lower connection must be straight, the same conditions observed when brakes are applied to both trucks."

If I understand this clause rightly, it means that if these brake connections are not secured in the manner described here, the cars are to be rejected.

Mr. ADAMS: That is the intention.

The CHAIRMAN: In what other way could they be secured?

Mr. ADAMS: Many have no nut on the inside of the beam, and consequently the nut on the outside has nothing to hold it tight, and it rattles loose and the brake connection pulls out.

Mr. HITCHCOCK: We don't experience that trouble. I move to strike out the words "each side of beam." We always put a jam nut on the outer end in our cars.

The CHAIRMAN: It is moved that the words "each side of side of beam" be stricken out, and a nut with a jam nut, the two nuts checked together on the end of the connection rod, be substituted for the arrangement indicated in the clause.

Mr. ADAMS: We put double brakes on all the cars we build at present; and a majority of car builders believe that all cars should have brakes on both trucks, because a tram can be handled more easily, and the wheels are not so liable to slip.

The CHAIRMAN: We put brakes on all the wheels in our new cars.

Mr. Hitchcock's motion was not seconded.

The next clause of Rule 3 is *m*, as follows: "Brake wheels, step ladders, or running boards in bad order, or insecurely fastened." The interpretation of this clause is as follows: "Running board must be sound, and securely fastened to roof of car. Roof grab-irons, ladder handles on the side of the car, sill steps, ladder sides, rails and ladder rounds all to be sound, and securely fastened to car body by either bolts or coach screws." The question is asked, "Would you fasten the ladder handles to a car with coach screws?"

Mr. ADAMS: Yes; if the coach screw is of proper size and length. A suitable coach screw is as secure a fastening as is a bolt, if put into good sound timber of good thickness, and in many cases better, because sometimes a nut will get lost off and the bolt come out. In securing iron to wood, the wood will shrink and let the nut loose, while the screw will hold. If a ladder round is properly put on it will hold better with a screw than a bolt.

A running board is not securely fastened by tin cleats nailed on and soldered to the roof. Every running board should be fastened by a No. 20 lag screw going into the ridge.

The CHAIRMAN: The next clause of Rule 3 is *n*: "Drawbars or attachments in bad order."

On motion of Mr. ADAMS, it was voted as the sense of the meeting, that the interpretation of clause *n* of Rule 3 in relation to drawbars or attachments in bad order, as set forth by the Boston & Albany and New York Central, should be adopted.

The CHAIRMAN: The first clause of the interpretation under this head is as follows: "Drawbars (wrought) when broken off outside of tenons, or cracked or broken in the opening of face plate, or in the angles of the pocket, or through rivet holes, or when filling is gone. (Cast) when cracked or broken through pin-hole, or back of head, or when bolts or rivets gone when wrought pocket is used, reject."

Mr. HITCHCOCK: Thousands of cars run without any filling.

Mr. MARDEN: It depends upon the size and strength of the straps that the filling is put into. We passed a car where it was doubled up, the two straps near together, on account of the filling being gone. If the straps are of sufficient strength in themselves to resist the pressure, they might be safe enough to run with; but I have never seen a wrought-iron drawbar that was strong enough itself without the filling. It might do to send the cars to their destination if in fair condition when received.

Clauses 2, 3, 4, 5, 6 of the interpretation of Clause *n* of Rule 3 were read by the Chairman, and passed without discussion.

The CHAIRMAN: The 7th Clause is as follows: "Draw timber rejected when split or broken through bolt holes, and will be accepted with one draw timber bolt gone, when the remaining bolts are in good condition. When down, allowing a space of ⅝ in. between the same and the draw sill, reject."

Mr. SOULE: They frequently shrink more than ⅝ in., and cannot always be screwed up, as the timber must be cut off.

Mr. ADAMS: The draw-sills are not in proper condition if down ⅝ in. It would not shrink quite as much under the end timber, and would pass if you get it up to within ¼ in., but the bolts must be screwed up.

Mr. FLETCHER: Would you reject a car, built with green timber and the bolts rusted in tight? They cannot be tightened when the car is loaded, and if rejected there will be a block all through the country. Such a car should be put in order, but it cannot be done on the track.

The CHAIRMAN: The Boston & Albany and New York Central roads interpret the Master Car Builders' rule in regard to drawbars or attachments in bad order to mean that a draft timber settled down from the draf sill so as to have a space of ⅝ in. between the two is in bad order and should be rejected.

Mr. ADAMS: This rule probably did not contemplate the matter of shrinkage; a great many cars come with broken draft bolts, and the draw stick gets down from that cause. That undoubtedly was mainly the thing to be covered here, and they could not make a rule to cover that absolutely and nothing else, and so fixed the space at ⅝ in.

Mr. SOULE: It would be better to specify how many bolts should be there, than how many may be gone.

The CHAIRMAN: That rule and interpretation cannot be improved, because cars differ so in construction. They have been very lenient in allowing ⅝ in. space before rejection, because a loose draw, though a slight defect, may cause the whole rigging to be pulled out. The draw rigging should be kept in first-class condition, or rejected.

Clause 8 was read and passed by without discussion.

The CHAIRMAN: Clause 9 is as follows: "Drawbars that have wrought iron guides bolted to plank (called perch plank), secured to car body by a king bolt passing through a wrought iron strip that is bolted to the plank, and wrought iron carry iron in the form of a yoke bolted to end sill, will be reejected.

Mr. TAYLOR: Many northern lines are trying to get rid of that kind of drawbar, and have agreed to keep them at home.

The CHAIRMAN: They are mainly old roads in New England, old equipment built with the loose or perch drawbar, and are not worth new draw sills.

Mr. ADAMS: We have many such cars. We decided, two years ago, not to offer for delivery or receive any car with a loose drawbar.

The CHAIRMAN: The interpretation in regard to Ames' drawbar is as follows: "Ames drawbar must be free from cracks or breaks, secured to wrought pocket by two bolts or rivets, with pin, link, trunion, lever and chain, all to be in place and secured according to original construction."

On motion of Mr. HITCHCOCK, it was voted to reject this interpretation of this portion of Rule 3, on the ground that he point is covered by Rule 2.

President Marden here took the chair.

Clauses *o*, *p*, *q* and *r* of Rule 3 and the interpretation of the latter were read and passed by without discussion.

The PRESIDENT: Clause *s* of Rule 3 is as follows: "Special or general defects of bodies or trucks which render cars unsafe to run."

The first and second clauses of the interpretation of Clause *s* were read, but not discussed.

The PRESIDENT: The 3d clause of the interpretation is as follows: "Body bolster side bearings, when cast iron, must be in place and secured with two bolts and nuts; if wrought iron, with two coach screws or dog nails.

Mr. BLACKALL: Enforcing that third class relative to two bolts on the side bearing would stop nine out of ten cars on some of our western roads.

Mr. ADAMS: Every possible means should be taken to discourage the use of such cars, or wrecks will ensue. At a meeting of the general officers of the New York Central with the general officers of the Boston & Albany, they pledged themselves that the rule should be observed by each of those companies. We may make some concessions in exceptional cases.

Under the head of Trucks, in Rule 3, the interpretation (six clauses) was read and passed by without discussion.

The PRESIDENT: Rule 4 is as follows: "A car with defects which do not render it unsafe to run must be accepted, but in such cases the company to whom such car is offered may require that a defect card shall be securely attached to the car, preferably on the inside of cross-tie timber."

The interpretation is as follows: Cars that have old defects for which no provision has been made in the interpretation of the rules will be passed under check and notation, the receiving road to furnish the delivery road a copy of the same. All new defects must be carded as per Rules 4 and 5. No repairs will be made to a car so carded, unless absolutely necessary to return it in safety to the road applying the card."

Mr. DORAN: There have been objections made by different railroads to applying cards, and I think the point is well taken, especially in regard to old defects.

Mr. ADAMS: We have adopted the plan indicated in the interpretation of Rule 4, but I don't believe in it.

Mr. DORAN: We pass about 50 per cent. of the cars we receive under notation. Last year we received 300,000, and delivered 50 per cent. of them. We have 15 inspectors. I found in the month of June that of 15,000 cars that went from Albany in apparent good condition, when they reached North Adams junction, we had to repair 10 per cent. of them before they went on to the Middle Division; and of the west-bound, we had to repair 20 per cent. of 14,000 odd before they came to Albany; and when they reached Albany the New York Central threw out 50 per cent.

Rules 5 and 6 were read, but not discussed. They were accepted.

The PRESIDENT: The next is Rule 7, under the head of DEFECTS FOR WHICH OWNERS ARE NOT RESPONSIBLE, as follows: "Roofs lost from cars on account of faulty construction shall be replaced at the expense of the owners."

The interpretation is as follows: "When cars are delivered with defects as named herewith, they should be classed as ordinary wear, and received by owner, when there has been no evidence of severe usage. 1st. Brake heads or shoes worn out. 2d. Pedestals cracked. 3d. Centre plates broken through plates or ring. 4th. Column guides and column castings broken as shown in paragraph 2 of trucks. 5th. Bolster and spring planks broken. 6th. Truss rods on trucks and body broken. 7. Bolsters and journal box springs broken. 8th. Spread trucks. 9th. Loose deadheads. 10th. Loose sheathing in side of car. 11th. Loose tin or board roof. 12th. Ends of car bulged out. 13. Cars low of trucks when wheels come in contact with intermediate sills."

Mr. LAUDER: As I understand this matter, what is printed after Rule 7 is not an interpretation of that rule, but simply an agreement between the Boston & Albany and New York Central roads.

Mr. ADAMS: This printing in italics or between inverted commas is an agreement between the roads.

The PRESIDENT: I understand that if we agree to the interpretations here given, we adopt them as the sense of this meeting.

Mr. LAUDER: Yes, sir; for the guidance of the Master Car-Builders' Association at their next meeting.

Mr. ADAMS: Our General Superintendent told me yesterday that having sent these books containing the rules and interpretations to the various roads which connect with ours, he had received answers from six or eight superintendents, expressing themselves satisfied with them, and saying they would apply them on their roads.

Mr. LAUDER: The action we take in this discussion will have quite an important bearing on the action of the Executive Committee of the Master Car-Builders' Association at their next meeting, with reference to revising their rules. Meanwhile, I don't understand there is any objection to any road adopting any of the rules and intepretations as printed here.

The PRESIDENT: What we desire is the sense of the members of the club in regard to the interpretation of the rules. I would ask Mr. Adams, in case he makes repairs of defects noted after Rule 7, if he would charge the expense to the owners?

Mr. ADAMS: We are allowed to by the rules of the Association as to roofs, but as to the other items I don't think we would be justified in so doing.

The PRESIDENT: Take the 11th clause, "loose tin or board roof."

Mr. ADAMS: We should probably tack it down with some shingle nails, and let the car go home. It comes under natural wear, which we don't consider ourselves responsible for.

Mr. DORAN: When this matter was under discussion at West Albany, it was considered that these items after Rule 7 specified defects which were the result of ordinary wear, and the cars should be accepted when returned to the road owning them, the mileage received being sufficient compensation. So far as the entire interpretations are concerned, they are a matter entirely between the Boston & Albany and New York Central roads; if other roads adopt them they have made some headway.

Mr. HITCHCOCK: I think it important to define what ordinary wear is.

Mr. LAUDER: We ought to take some action toward recommending the Executive Committee of the Master Car Builders' Association to formulate some rules that would cover this point here, where certain old defects here specified are manifestly caused by usage, ordinary wear; and that such cars should be received back by the owners.

Mr. ADAMS: My understanding was, when the discussion of this matter by the Club began, that when these interpretations were read in connection with the rules, if there was no objection to them, it should be considered as the sense of this club that they were correct. I move that this Club recommend to the Executive Committee of the Master Car Builder's Association the embodiment in their rules of what is appended to Rule 7 as printed, viz.: the paragraph relating to the delivery of cars with defects and the 13 items or clauses specifying various defects. Motion adopted.

Rules 8 and 9 were read but not discussed, but were adopted.

The PRESIDENT: Rule 10 is as follows: "Loose wheels may be replaced, or wheels out of gauge may be refitted, and charged to owners."

Mr. LAUDER: That rule might be made to read, "Loose wheels may be replaced, or wheels out of gauge when rejected may be refitted by the road offering the cars for interchange, and charged to the owners.

Mr. ADAMS: Any road that accepts wheels out of gauge, perhaps ¼ in. wider than the limit of gauge allowed, should put them in order before it asks another road to accept them.

Mr. LAUDER: We should refuse to receive a car with wheels out of gauge.

Mr. ADAMS: These offering the car have the advantage. They say "There is your freight; we have delivered it. The law would compel you as a common carrier to receive that freight."

Mr. LAUDER: Suppose they offer you a car with a drawbar gear?

Mr. ADAMS: If they have got it to a point where you ordinarily receive freight, you have got to receive it.

The PRESIDENT: You are right about the laws of common carriers, but our rules provide that the road shall deliver the cars in good running order. I think this matter of the receiving road being obliged to transfer the freight is all wrong.

Mr. ADAMS: I think if a contract is made in Portland, Me., to deliver freight in Chicago, that contract will hold the parties to deliver that freight, and if any one blocks the way and don't receive it, the law will hold him responsible.

The PRESIDENT: I understand that is the law of common carriers, but I think the law is wrong, that the receiving road shall transfer the freight. It gives a road a chance to keep and run its cars in poor condition.

A letter from the Secretary of the Western Railroad Club to the Secretary of the New England Railroad Club was read and placed on file by vote of the club.

On motion of Mr. Curtis, amended by Mr. Lauder, it was voted that a committee of three, consisting of the President, Vice-President and Mr. Adams, be appointed to attend the next meeting of the Western Railroad Club at their own expense.

Rules 11, 12 and 13 were read, but not discussed.

The meeting then adjourned to the second Wednesday in December at 2 p. m.

The subjects for discussion at the December meeting are: In the afternoon at 2 p. m., the Interchange of Cars; in the evening, Standard Size of Wheel Centres for Steel-tired Car and Engine-truck Wheels.

Interpretation of the Rules of Interchange of Cars.

In another column we print a discussion which took place at the New England Railroad Club on the Rules of Interchange of Cars. The Interpretations of the Rules Governing the Interchange of Cars are printed in italics below, and the illustrations explain clearly the meaning of the interpretations. The rules not affected by the interpretation are omitted. These interpretations are in use on the New York Central and the Boston & Albany.

GENERAL.

RULE 1.—Each railway company shall give to foreign cars, while on its line, the same care as to oiling and packing that it gives to its own cars.

DELIVERING AND RECEIVING CARS AT INTERCHANGE POINTS.

RULE 2.—Cars must be delivered in good running order, and returned in as good general condition as when received. (*And will be subject to Interpretations as noted herewith.*)

RULE 3.—Cars may be refused for any of the following defects:

Defects of Wheels.

c. Wheels cracked or broken in any manner. (*Wheels cracked through either plates, spokes, hub or tread, or having cracks at the base of flange on tread extending more than six inches in length, reject.*)

f. Wheels with flanges chipped, so that they are unsafe to run. (*Wheels chipped on the flange exceeding two inches in length, or ⅛ inch past the centre of flange, or a continuation of chips that are ⅛ inch past the centre, reject.*)

g. The determination of flat spots, sharp flanges, thin flanges and chipped treads shall be made by a gauge of the following form. (*Defect gauge to be applied at point where throat of wheel gives ⅞ inch radius.*)

Defects of Axles.

k. Out of gauge or wheels that measure less than 4 ft. 5 in. or more than 4 ft. 5½ in. between flanges, or less than 5 ft. 4 in. over treads.

Cars may be refused if their wheels measure less than 4 ft. 5 in. or more than 4 ft. 5¼ in. at the dimension A in accompanying illustration. The dimension B must not be less than 5 ft. 4 in.

OTHER DEFECTS.

l. Brakes in bad order, reject, unless following conditions are complied with.

(*1st. Brake wheel secured to shaft with nut or key.*)

(*2nd. Bottom of brake shaft secured by nut or key.*)

(*3d. Brake chain secured to shaft with bolt and nut.*)

(*4th. Upper brake shaft bearing properly secured to end or top of car by either two coach screws or two bolts.*)

(*5th. Brake ratchet wheel must be sound, and secured to shaft by either key or set-screw; may be accepted with four teeth broken, when not more than two are connected; rejected when teeth are worn so pawl is not effective.*)

(*6th. Brake pawl secured to brake step, or to upper brake shaft bearing, with bolt and nut, when applied to roof of car, with either bolt or coach screw. The pawl must be sound and the point effective.*)

(*7th. Brake step secured to the two brackets by two bolts in each of the two brackets, secured to car by either four bolts or four coach screws. When brake step is split through both bolt holes at outer edge, or when cracked or worn so that the bolt is loose holding the pawl, and will allow it to turn round, they must be rejected.*)

(*8th. Brake shaft step secured to car by either two or four bolts or coach screws. When the draw bar carry irons form the step, the two bolts passing through draw timbers must be effective.*)

(*9th. Brake hanger secured to car body or trucks with the full complement of bolts and nuts the hanger is drilled to receive; also secured to brake head or beam in a like manner. In case a brake hanger or brake head that are not standard are already applied and are secured as above noted, they will be accepted.*)

(*10th. Brake heads must be in condition to hold the shoe in place when applied.*)

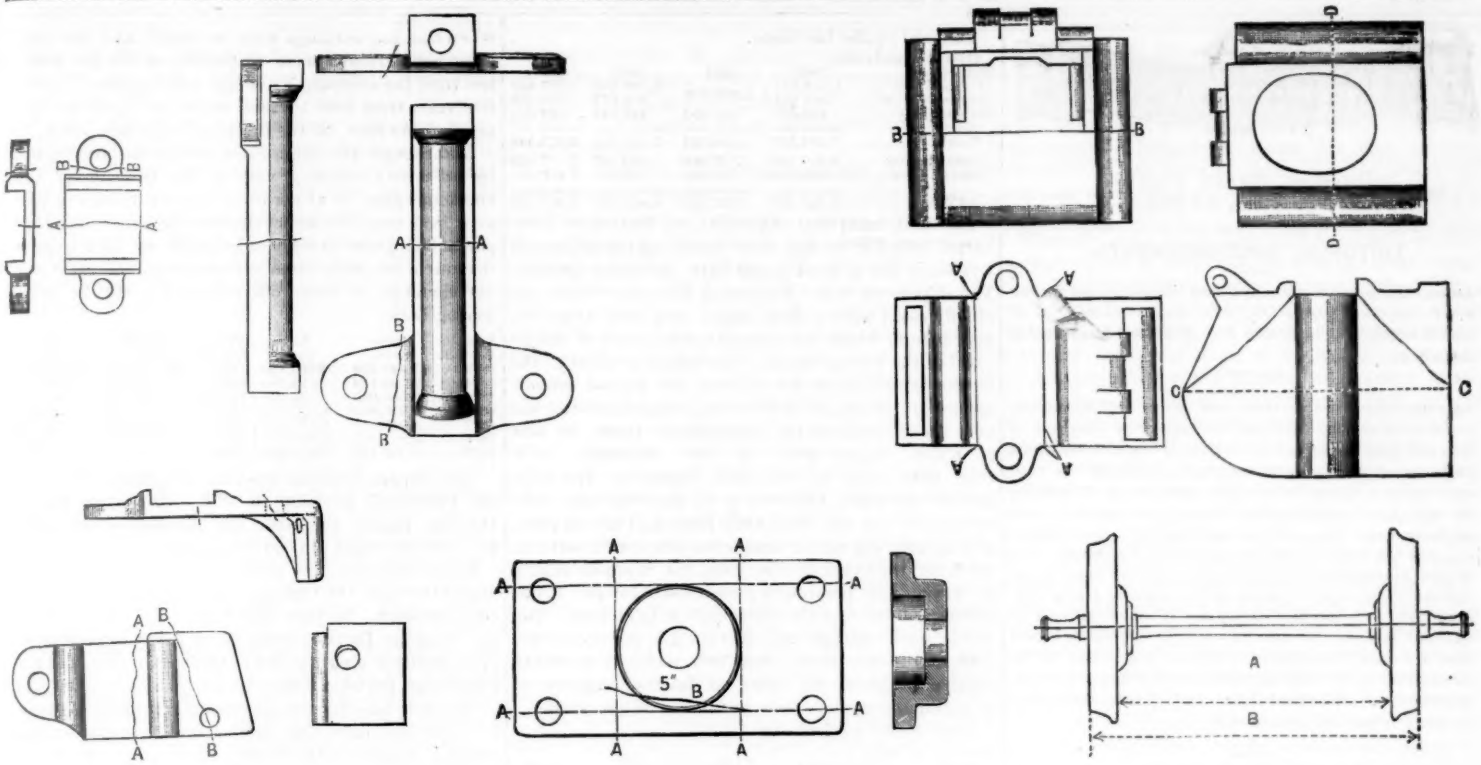
(*11th. Brake shoes must be secured to brake head by either key bolt, bolt and nut, or key, as shall be required by form of head. When brake shoes are worn down to ¼ in. thick in centre they shall be considered worn out.*)

(*12th. Brake wheels cracked in spoke, rim or hub, must be rejected.*)

(*13th. Brake beam must be sound, and when hung to body, provided with guide irons.*)

(*14th. Brake beam fulcrums (cast iron) secured by 2 bolts and nuts to brake beam; when casting is cracked, reject. Wrought-iron fulcrum to be secured by nut lock or jambed nut.*)

(*15th. Brake connection (lower) secured to brake beam with one nut each side of beam, secured to brake lever with key bolt and key, (upper) secured to lever with either hook*



or key bolt and key, and to chain connection by hook. Inside brakes; the lower connection must be straight, the same conditions observed when brakes are applied to both trucks.)

m. Brake wheels, steps, ladders or running boards in bad order, or insecurely fastened.

(*1st. Running board must be sound and securely fastened to roof of car. Roof grab irons, ladder handles on the side of car sill steps, ladder sides, rails and ladder rounds all to be sound, and securely fastened to car body by either bolts or coach screws.*)

n. Draw bars or attachments in bad order.

(*1st. Draw bars (wrought) when broken off outside of tenons, or cracked or broken in the opening of face plate, or in the angles of the pocket, or through rivet holes, or when filling is gone. (Cast) when cracked or broken through pin-hole, or back of head, or when bolts or rivets gone when wrought pocket is used, reject.*)

(*2d. Draw bar stem, rod or bolt, secured back of draw bar follower plates by nut or flat key, these to be secured by either a ring or spring cotter. When cracked or broken in any way, reject.*)

(*3d. Draw bar stops must have all bolts in, with nuts on. When cracked through bolt holes, reject.*)

(*4th. Draw bar guides and followers must be in place, and free from breaks.*)

(*5th. When the spring is composed of two or more coils, draw bar springs accepted with one coil broken.*)

(*6th. Draw bar carry iron must have two effective bolts, one each side.*)

(*7th. Draw timber rejected when split or broken through bolt holes, and will be accepted with one draw timber bolt gone, when the remaining bolts are in good condition. When down, allowing a space of ⅜ inch between the same and draw sill, reject.*)

(*8th. Deadblock wood must be sound and free from breaks; castings must be free from cracks through bolt holes, and properly secured in place with bolts or rods and nuts.*)

(*9th. Draw-bars that have wrought-iron guides bolted to plank called (perch plank), secured to car body by the king bolt passing through a wrought-iron strip that is bolted to the plank, and wrought-iron carry iron in the form of a yoke bolted to end sill, will be rejected.*)

(*Ames' draw bar must be free from cracks or breaks, secured to wrought pocket by two bolts or rivets, with pin, link, trunnion, lever and chain, all to be in place and secured according to original construction.*)

o. Draft sills or draft timber spliced, reject.

p. Intermediate or outside sills recently spliced in a manner not prescribed by the Rules, reject.

q. Leaky roofs on merchandise or grain cars. (*Roof must be whole, sound, and securely fastened.*)

r. Doors which are not sufficient protection against fire or storms

(*1st. Doors hung from the top must have at least two shoes, or their equivalent, to each door. The shoes must be in condition to prevent the door from swinging out at the bottom, and so placed to prevent the same when open or shut.*)

s. Special or general defects of bodies or tracks which render cars unsafe to run.

(*1st. When sheathing is broken, or holes cut through sides or end of car, they will be rejected.*)

(*2d. When new sheathing is used on side or end of car, all letters and figures must be replaced to conform with letters and figures of said car.*)

(*3d. Body bolster side bearings, when cast iron, must be in place and secured by two bolts and nuts; if wrought iron, with two coach screws or dog nails.*)

Trucks:

(*1st. Arch bars, pedestal tie bars cracked at bolt holes or in the angles, and continuous iron truck frame bent in such manner as to spread the pedestals, or cracked at both holes, reject.*)

(*2d. Journal box, centre plates, column guides, column and truss castings, will be received as shown.*)

(*Journal box will be received with*

Top of Journal box broken outside of			*A.*
Front	"	"	*above B.*
Side	"	"	" *C.*
Back	"	"	" *D.*)

(*Cars will be received when truss casting is broken through A or B, with one good bolt each side of column, when truss rod is in good condition.*)

(*Centre plate will be received broken outside of A on one side, with two good bolts in each plate, in a diagonal position.*)

(*Rings on centre casting continuous draw rods will be received broken less than five inches, as shown at B.*)

(*Guide casting will be received broken at A, or the ear on either side of B, when secured with one good bolt on each side.*)

(*Column casting will be received broken at A, or the ear on either side of the column at B.*)

(*3d. All bolts through arch bars, journal box and pedestal tie bar, and through arch bar, column casting and pedestal tie bar, must be in place, with one nut on each bolt; also, truck side bearing secured by two bolts in each bearing.*)

(*4th. Bolster hangers must be free from cracks; lower swing hanger pivot must have keys outside of hanger on each end.*)

(*5th. Track bolster truss rods will be rejected when rods do not pass half way or more through nuts.*)

(*6th. Truck transoms broken at swing hanger mortise, bolster and swing plank in centre, wheel piece at intersection of transoms and end pieces, and end piece at centre or end, will be rejected.*)

RULE 4.—A car with defects which do not render it unsafe to run must be accepted, but in such cases the Company to whom such car is offered may require that a defect card shall be securely attached to the car, preferably on the inside of cross-tie timber.

(*Cars that have old defects for which no provision has been made in the Interpretation of the Rules, will be passed under check and notation, the receiving road to furnish the delivery road a copy of the same. All new defects must be carded as per Rules 4 and 5. No repairs shall be made to a car so carded, unless absolutely necessary to return it in safety to the road applying the card.*)

RULE 5.—Defect cards shall be 4½ inches by 6½ inches, and of the form shown below. They shall be printed on both sides, and shall be filled in on both sides with ink or indelible pencil.

(*Name of Road.*)

Car No.....Date.....
Initial.....Line.....
Will be received at any point on this Company's line, with the following defects:
.....
.....

NOTE.—Fill in defects on both sides with ink or indelible pencil. Attach this card securely to the inside cross tie timber.

.....
.....
.....Inspector at.....

DEFECTS FOR WHICH OWNERS ARE RESPONSIBLE.

RULE 7.—Roofs lost from cars on account of faulty construction shall be replaced at the expense of the owners.

(*When cars are delivered with defects as named herewith, they should be classed as ordinary wear, and received by owners, when there has been no evidence of severe usage.*)

1*st. Brake heads or shoes worn out.*)
2*d. Pedestals cracked.*)
3*d. Centre plates broken through plates or ring.*)
(*4th. Column guides and column castings broken as shown in paragraph 2 of trucks.*)
(*5th. Bolsters and spring planks broken.*)
(*6th. Truss rods on trucks and body broken.*)
(*7th. Bolsters and journal box springs broken.*)
(*8th. Spread trucks.*)
(*9th. Loose dead blocks.*)
(*10th. Loose sheathing on side of car.*)
(*11th. Loose tin on board roof.*)
(*12th. Ends of car bulged out.*)
(*13th. Cars low on trucks when wheels come in contact with intermediate sills.*)

For the remainder of the rules no interpretations are added.

Foreign Railroad Notes.

Sweden, long famous for its excellent charcoal-iron, is about to have its first Bessemer steel works. Heretofore it has imported its rails from England. It has not railroads enough to give work to a large Bessemer plant. The state railroads have contracted with the projected works to take about 4,000 tons per year for four years at $28.62 per ton for the first two years and $27.28 for the last two, which were the prices offered by an English firm.

One of the older narrow-gauge railroads of Europe is that from Turin to Rivoli, in Italy, 7½ miles, which has been worked for 15 years. The gross earnings of this railroad last year were $31,012; the working expenses, $18,830; the net earnings $12,182, or $1,624 per mile. It is more a substitute for a street railroad than an ordinary rail road, its freight earnings being less than $1,100. The earnings per train mile were about 62 cents gross and 24 cents net, there being an average of nearly nine trains each way daily.

Aug. 9 last was celebrated the opening of a railroad in Siberia from Jekaterinenburg eastward to Tjumen, 201 miles, about in latitude 56. This forms an extension of the railroad built a few years ago from Perm, on the Kama River, southeastward over the Ural Mountains to Jekaterinenburg, only a small part of which is in Asia. This line is not as yet connected with the railroad system of European Russia, Perm being in an air-line more than 300 miles northwest of Kasan, the Kama River, a branch of the Volga, being navigable between those points part of the year; but it is inteaded to build a railroad connection between Kasan and Perm hereafter, and westward from Kasan to Murom, the present eastern terminus of a railroad from Moscow, next year. The new railroad was built by the government for the purpose of giving work to the starving population east of the Ural Mountains, but it is likely to have considerable commercial importance, being the sole line of railroad communication between Siberia and Europe. Tjumen, the eastern terminus, is on a tributary of the Irtisch River, as that is of the Obi, whose basin is one of the largest in the world. Tjumen is about 1,400 miles due north of Merv, the terminus of the other just completed Russian railroad in Asia, the trans-Caspian.

During the first half of 1886 the railroads of Austria-Hungary carried 26,577,427 passengers, and 33,001,411 tons of freight, and earned $43,098,242, or $3,111 per mile of road, more than three-fourths of which was for carrying freight. Compared with last year, there was an increase of nearly 1 per cent. in the number of passengers, a decrease of 3½ per cent. in the tons of freight, a decrease of 7¼ per cent. in the passenger earnings, of 5 per cent. in the freight earnings, and of nearly 6 per cent. in the total earnings. The mileage worked was 1¼ per cent. more than last year.

The railroads owned and worked by the governments earned 30½ per cent. of the total earnings, and the private railroads worked by the state more than 19 per cent., so that just about half the earnings were by state roads, though it was but a few years ago that the state had no lines of importance. In Hungary more than three-fourths of the earnings of the roads wholly in that kingdom were by railroads owned by the state, but only about 1 per cent. by private roads which the state works. The whole Hungarian system is small, however, its total earnings (exclusive of those lines extending over both kingdoms) for the half-year having been but $7,728,076, which is exceeded by many single companies here, and is about two months' earnings of the Pennsylvania Railroad. In Austria, state ownership has made comparatively less progress, the government roads having earned about one-third of the total of railroads wholly in that kingdom, but the private roads worked by the government earned nearly 40 per cent. of them. Just about a third of the railroad earnings of the two kingdoms were by roads partly in one and partly in the other, none of which are state roads (though one of them was, long ago), and among these are the greatest railroads of the dual kingdom. The greatest of these earned but $7,122,000 in the first half of this year, a second $5,823,360. One Austrian road earned $4,315,700, but all the other roads in both kingdoms are small, none earning as much as $1,500,000. Especially is this the case in Hungary, where the largest earnings of any of the 12 private railroads were less than $550,000.

RAILROAD GAZETTE

Published Every Friday,
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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE BALTIMORE & OHIO REPORT.

The Baltimore & Ohio Railroad report for its last fiscal year, ending Sept. 30, like the reports of the other trunk lines, shows a large increase over the previous year in gross earnings and a considerable one in net earnings, but the gross were much less than in 1883 and 1884, and the net much less than in any of the five years from 1879 to 1884, and even a little less than in 1879, when the gross earnings were $4,228,000 less than last year.

The mileage worked, the gross and net earnings and the working expenses of the whole Baltimore & Ohio system have been for 11 years:

Year o Sept. 30.	Miles.	Gross earnings.	Expenses.	Net earnings.
1876	1 456	$15,031.236	$9,609.857	$5,421.380
1877	1.456	13.208,860	8,226,055	4,892,805
1878	1,456	13.765,285	7,769 301	5.995,979
1879	1.449	14.19?,981	7.691,596	6,502,385
1880	1.449	18.317,740	10,330,970	7,986,370
1881	1,495	18,463 877	11,390,479	7,073 398
1882	1.509	18 383.876	10.9 9.214	7.454,662
1883	1,584	19,739.838	11,034,015	8,705,823
1884	1,622	19,436.607	11,676.307	7.760,300
1885	1,659	16,616,642	10,973.585	5,643,057
1886	1.690	18,422,437	12,035,742	6.386,695

Thus the working expenses were larger this year than ever before, and this has brought the net earnings much below those of other years when the gross earnings approached those of this year. This is probably due largely to a decline in the local rates below what the company was able to command a few years ago, but probably also to the postponement of expenditures from 1885 to 1886, as the large reduction of $642,000 (6 per cent.) from 1884 to 1885 was made in spite of an increase in traffic. Compared with 1885 the increases last year were:

In gross earnings	$1,805,795, or 10¾ per cent.
In expenses	1,06?,157, or 9⅔ "
In net earnings	743,638, or 13¼ "

The statistics of traffic are very incomplete, but such as are given indicate an important increase in some of the most important business. Thus the tonnage of what is called "through" freight in both directions is reported as follows:

Year.	Tons.	Year.	Tons.
1873	640,265	1880	1,980,397
1874	752,256	1881	2.014,110
1875	872 161	1882	2,04?,227
1876	1,093,393	1883	2,108,325
1877	1,047 645	1884	2,275,252
1878	1,149,469	1885	2,338,147
1879	1,425,629	1886	2,731,119

What is included in this through freight we do not know, but it is plain that the great increase in it has added little or nothing to the company's net earnings, as with nearly twice as much "through" freight as in 1879 it has smaller net earnings.

The coal traffic has been:

Tons coal and coke: Main stem.	1883.	1884.	1885.	1886.
To Baltimore	1,654,821	2,828,609	2,288,949	2,237.448
Local and West	517.041		754 677	946 639
For company	409,695	439,912	443,544	483.361
Total	2,581,557	3,268,521	3.487,170	3,673.448
Pittsburgh Div	2,402,130	2,157,606	2,003,982	2,427.238
Trans-O. lines	684,696	966,548	909,594	1,329,681
All lines	5,668.383	6,392,675	6,400.746	7,430,367

The Main Stem coal shipments to Baltimore have varied little for the last three years, but the shipments westward and to local points have increased greatly. The shipments on the Pittsburgh Division (which are chiefly coke) were a fifth larger last year than the year before, which is a natural consequence of the revival of the iron industry. This brings it about to the figures of 1883, since which time the almost universal use of natural gas in Pittsburgh manufactories has very greatly reduced the consumption there, so that a much larger part of the shipments now than then goes to the blast furnaces. The most notable increase, however, is in the coal and coke shipments over the trans-Ohio lines, and this is probably largely due to the completion of a direct outlet to them for the Connellsville coke, the Western supply of which had previously gone mostly by the Pennsylvania lines and the Pittsburgh & Lake Erie. The whole coal tonnage has increased 31 per cent. since 1883 and 16 per cent. since 1885, which is certainly notable progress, the more so because carriers of bituminous coal have been multiplied of late years.

Other traffic statistics are:

Brought to Baltimore:	1883.	1884.	1885.	1886.
Flour, bbls	701,935	717.258	766.163	752,150
Wheat, bu	6,633.443	6,415,550	3,200,025	3,437,159
Corn, bu	4,935,900	3,472,940	8,383,859	9,474,275
Oats, bu			1,216,503	684,168
All grains, bu	12,770,392	11,553,052	13,048 258	13,718,428
Live stock, tons	90.530	82 187	67.890	70,220
Lumber, tons	93,332	107,398	86,560	92,831

There is little change in the flour and grain—less than was to be expected in view of the great changes in the total seaboard receipts and exports. The falling off in live stock may be due to larger dressed meat receipts. The changes in lumber are not great.

It is surprising to see that the "Main Stem and Branches," which includes the Baltimore & Ohio trunk line, earned but very little (1½ per cent.) more last year than the year before, in spite of the higher through rates, which might lead to the conclusion that there was a serious decline in the through traffic of this railroad, but for the possibility that some of this traffic may have been diverted to the Pittsburgh Division, which has been connected by a direct line south of Pittsburgh with Wheeling in order to give a more direct outlet to the West over the Baltimore & Ohio lines to the Connellsville coke traffic, which goes to fill cars which would otherwise go west empty. A diversion of traffic of any kind, through or local, from the Main Stem to the Pittsburgh Division and the Wheeling & Pittsburgh Division, while it might increase the net earnings of the whole system, would decrease both the gross and net earnings of the Main Stem. While the gross earnings of the Main Stem and Branches increased but $113,361, its net earnings increased $56,465, so that here the expenses nearly kept pace with the earnings, leaving for the other lines nearly the whole increase in net earnings. Thus the earnings of the Main Stem and Branches and of all the other lines together were:

Main Stem, etc:	1885-86.	1884-85.	Increase.	P. c
Gross earn	$9 846,613	$9,733,252	$113,361	1.2
Expenses	5.820,247	5,763,252	56,895	1.0
Net earn	$4,026,366	$3,969,900	$56,466	1.4
Other lines:				
Gross earn	$8.575,824	$6,883,390	$1,692,434	24.6
Expenses	6,215.495	5,210,233	1,005,262	19.3
Net earn	$2,360,329	$1.673,157	$687.172	41.1

Thus nearly 94 per cent. of the increase in the gross earnings and 92½ per cent. of the increase in net earnings was on these "other lines," which have less than half the earnings of the whole system, but which had an increase of nearly one-fourth in gross and more than two-fifths in net earnings. As the Erie, the New York Central and the Pennsylvania have all had very large gains in both gross and net earnings on their lines corresponding to the Baltimore & Ohio's main stem, the failure of the latter to make any considerable gain over the worst year it has had since 1877 is remarkable and needs explanation. For the gross and net earnings of the "Main Stem and Branches" for 14 years have been:

Year to Sept. 30.	Gross earn.	Net earn.	Year to Sept. 30.	Gross earn.	Net earn.
1873	$12 252.844	$4,934,796	1880	$11,2:9 881	$5,172,881
1874	11,693.955	5,018,060	1881	11,122,259	4,846,616
1875	10.514 179	4,337,378	1882	10,5?6.570	4,572,944
1876	9,632,361	4,2 0.726	1883	11,579,839	5,432,183
1877	8,262.045	3,656.893	1884	11,506 958	5,237,742
1878	8,563.957	4,039,612	1885	9,733 252	3,969,900
1879	8 864.827	4 341.245	1886	9,846,613	4,026,366

Here we see that while there have been four years (1876 to 1879) besides 1884–85 when the gross earnings were less than last year, there has been but one, 1877 when the net earnings were so small, and last year these net earnings were $1,026,000, or 20 per cent., less than the company's average net earnings for the five years from 1880 to 1884, which is equal to very nearly 7 per cent. on the company's common stock.

And though the other lines, which are largely, but by no means wholly, west of the Ohio, have the enormous gain of 41 per cent. in net earnings in 1886 over 1885, they still do not show in the long run the important progress which would make up for the great decline in the Main Stem net earnings, the gross and net earnings of these other lines for the 14 years having been:

Year to Sept. 30.	Gross earn.	Net earn.	Year to Sept 30.	Gross earn.	Net earn.
1873	$3.440,354	$616,780	1880	$7,087,880	$2,813,389
1874	3 253,134	512,380	1881	7,341,618	2,226.782
1875	3,930,060	108.195	1882	7.817.506	2.881,718
1876	5,398,875	1,200,655	1883	8,159.199	3,273,640
1877	4,946,815	1,325.912	1884	7.9?9,640	2 522.558
1878	5,201,323	1.956,367	1885	6.883.390	1.673,157
1879	5,329,154	2,161,140	1886	8,575,824	2,360,329

The Chicago Division was first included in 1875 and the Pittsburgh Division in 1876. The Philadelphia Division figures this year for the first time, with $115,000 gross and $15,000 net earnings.

The chief of the lines above included are the Pittsburgh Division, the Chicago Division, and the Central Ohio Division. Neither the Pittsburgh Division nor the Chicago Division ever yielded any considerable profit until the great revival of business in 1880, and the Pittsburgh Division is the only one which may be said even now to have become permanently profitable directly; all of them have some value and some a considerable valueby reason of the traffic which they command for the main line, which but for them would doubtless have had a still more serious decline in profits. It must be remembered that these "other lines" include about 1,100 miles of railroad, and that their net earnings when largest were but $3,320 per mile, and last year were but $2,150 per mile, so that it is evident that they do not, as a whole, do much directly to increase the company's profits, as the interest on their cost usually exceeds their net earnings. They have held their own much better than the Main Stem and Branches, but they cannot be said to have made progress since they first got on their feet in 1880, their average net earnings for the four years from 1880 to 1883 having been $2,798,881, and for the last three years $2,185,348. The year 1884–85, however, was so exceptional that it makes the average of the last three years unduly low, it is true, but the best of them, 1884, was much below the average of the four years previous, and there have been considerable additions to the system since its profits were largest.

In fact, as in so many other cases, the most that additional expenditures of capital and larger traffic seem able to do for this company is to prevent a rapid decrease in its profits. The capital account is now about $45,000,000 more than in 1873, and the traffic immensely greater, but the profits are but $835,000 greater.

The latest and the costliest of its recent additions to its property, the line from Baltimore to Philadelphia, is only just beginning to be felt. It will doubtless enable it to command a larger share of the Philadelphia through traffic (of which it has had very little), and make it more independent at New York, but that it will materially increase the net earnings of the whole system is by no means certain. Nor is it certain that the investment in it will be unwise, even if it does not make profits larger than they have been heretofore. As we have shown above, the tendency when little or nothing is done to increase facilities is towards a reduction of profits. To check this reduction is as legitimate a use of new capital as to increase profits where possible. It is not likely, however, to be regarded as creditable to corporation management, because in the nature of the case it is difficult or impossible to prove that profits would have been reduced if the additional expenditure had not been made.

Some of the separate lines not included in the "Main Stem and Branches" are important enough to deserve special examination. The most important of these is the Pittsburgh Division, which, like many of the Pennsylvania lines, is greatly affected by the condition of the iron industry. This is a costly road, and for a long time it was unprofitable, but it improved with the prosperity of the iron industry after 1879, in which year its net earnings were but $732,282. Since that year its earnings and expenses have been:

Year to Sept. 30.	Gross earn.	Expenses.	Net earn.
1880	$2,238,431	$1,226.654	$1,011,827
1881	2.500.548	1,376,075	1,124,473
1882	2,979,789	1,437,664	1,542,125
1883	2,813,173	1,334,898	1,478,275
1884	2.294,826	1.252,694	1,042,132
1885	1,999,960	1.226.540	773,420
1886	2,430,085	1,587,664	842,421

The revival of the iron industry last year is shown unmistakably by this division, whose 244 miles gained in gross earnings nearly four times as much as the 787

miles of the Main Stem and Branches, the increase being 21½ per cent. Its gross earnings were the largest since 1883, but were much less than in 1882 and 1883. But most of the increase of earnings over 1885 was absorbed by the larger expenses, which increased no less than 30 per cent., and the net earnings, though about 9 per cent. more than in 1885, were much smaller than in any other year since 1879.

The trans-Ohio lines have large gains in earnings over 1885, and especially in net earnings, which were extremely small then, but taken together they make but small returns after all. Their earnings and expenses have been:

Year to Sept 30.	Gross earn.	Expenses.	Net earn.
1880	$3 624,432	$2,449,190	$1,175,242
1881	3 721,783	2,886,523	835,260
1882	3 809,115	2,799 996	1,009,118
1883	4,145.915	2,873,331	1,272,584
1884	4,401 691	3,273,611	1,128,080
1885	3,720,993	3,072,715	648,278
1886	4,596,349	3,502,990	1,093,359

The gross earnings of these lines were larger last year than ever before, and the increase over 1885 is $875,000—nearly eight times as great as the increase on the Main Stem and Branches, which have three-eighths more mileage and an immensely greater traffic. The working expenses were so great, however, that the net earnings, though 70 per cent. more than in 1885, were less than in 1880, 1883 and 1884. The net earnings of these lines are always light. They were but $1,924 per mile last year, and $2,240 when they were largest, in 1884. The gains were large on all four of the divisions of these trans-Ohio lines, compared with 1885—20 per cent. on the Central Ohio, 24 per cent. on the Lake Erie Division, 22 on the Chicago Division, and 81 per cent. on the Straitsville Division. Compared with 1884, when the gross earnings were largest until last year, the gain is chiefly on the Central Ohio Division, which gained 8½ per cent., while the Chicago Division gained 2½ per cent. and the Lake Erie Division lost a little.

The increase in the "surplus fund" of the Baltimore & Ohio Company last year was $232,845. This may seem a large sum when we say that it is equal to $1.57 per share of common stock, but it is really a very narrow margin over the fixed charges, which are about $4,800,000 per year. The share capital of this company is so small that comparatively slight fluctuations in its profits equal a considerable dividend. Thus the decrease in net earnings from 1884 to 1886, $1,374,000, is more than 9 per cent. on the common stock. The President's report, which is all that is now published, does not give the income account for last year, but as the surplus was but $132,000 more than in 1885, while the net earnings increased $743,000, it is evident that there was a considerable increase in the prior charges. The new Philadelphia line has been increasing these while yielding nothing to meet them. Now that it is opened through it may be expected to do something to support itself.

RAPID FREIGHT MOVEMENT, AND HOW IT MAY BE ACCOMPLISHED.

After years of a stationary or even a decreasing traffic, there is now a revival of business which is already taxing to the utmost the full capacity of the rolling stock and terminal stations of the great trunk lines and many other railroads, and which seems likely to grow larger and larger. Already we hear of orders for thousands of additional cars, the possession of which must cause some apprehension to managers who remember how, with the present stock, their sidings have sometimes been crowded for fifty or a hundred miles back from their chief termini, waiting till a place could be cleared for their loads. Hence the means of increasing the capacity of the railroads with the least possible expenditure now commands the attention of all intelligent officials. Schemes of many kinds are suggested and tried. First, more cars are bought; then more sidings are required to accommodate them; sometimes double-tracking is resorted to; then follows a demand for an enormous increase of sidings at terminal points, where land is costly, in order that hundreds or thousands of loaded cars can be held as warehouses, awaiting the convenience or the ability of consignees to empty them.

So the mileage of freight cars is ridiculously low, and it is generally recognized that this low mileage is very largely due to the use of them as warehouses. No plan has yet been adopted whereby adequate compensation for the use of the cars in through traffic can be secured to the owners of them.

If the mileage of cars were to be increased, by higher speed and by lessening the average time required in loading and unloading them, by only so little as 20 per cent. (a result easily obtained by concerted action among the railroads), the gain would be equivalent to the addition of about 165,000 cars to the present equipment of the roads in the United States which is more than the additions made for the past four years; and there would be a corresponding increase in the capacity of existing main lines, sidings and termini, equivalent to an enormous expenditure of fresh capital.

Now, in England, merchandise freight is taken to London and delivered to the consignee's place of business from Liverpool, Manchester, Glasgow and most other places on the island, and between other important traffic centres 200 or 500 miles apart, regularly within 24 hours with as much certainty as a letter. One of the principal instrumentalities by which this is accomplished is that the railroad companies deliver the goods by their own drays, or by drays which they control; and, as a consequence, the cars are immediately unloaded and ready for use again, not, as with us, left standing for days, an impediment to other traffic.

The fact that the railroad companies interested control the unloading of the cars is sufficient to insure the utmost promptitude in discharging them. Another economy in respect to cars is that there the express freight trains carrying merchandise are run at a comparatively high speed, averaging something like 20 miles an hour, including stops; their safe passage at high speed being insured by the use of block signals, interlocking switches, etc., at junctions and at all important stations, thus enabling the railroads to be used to their utmost capacity.

There need be no hesitation in saying that by a reasonable expenditure for these appliances, and for good couplings and continuous brakes, with other improvements which will be mentioned, an enormous benefit may be gained by railroad companies at much less cost than by providing sidings and "terminal facilities"—by which is generally meant tracks on which to keep cars standing idle.

The first step necessary to be taken in order to realize the benefits which we have described would be for the railroad companies to adopt some plan by which they shall secure the prompt unloading of the cars at the termini, and English experience shows that this can be effected by their undertaking the delivery of the merchandise at the warehouses, instead of waiting the convenience of the consignees. This will overcome the most shameful feature now connected with our transportation, and will result in the agreement among the terminal railroads to pay a proper sum *per day* for the use of cars, as well as *per mile run*, because they can, under the circumstances, easily secure the prompt unloading of the cars, and an equally prompt return of them to their owners.

The next step in our programme is that the roads should build a better class of cars for through freight, which will admit of being run at a speed of at least 40 miles per hour. The experience with the fast mail cars and express cars in common use on the trunk lines shows that they may be run continuously at high speed, averaging at the rate of 500 miles a day, with as much certainty as the cars in our freight trains average 60 miles per day. We would propose that the trunk lines should unite in building all their new cars expressly for "rapid freight" traffic, with superior trucks, superior couplings, superior springs, and provided with the continuous brake; all details being after the Master Car-Builders' standards, so far as at present adopted or to be adopted. It would, indeed, be desirable that the master car-builders and superintendents of motive power of the several trunk lines (with as many of their connections as might desire to enter into this "rapid freight" organization) should meet and agree upon all the details of the cars to be constructed for this business.

The general interchange of cars of all descriptions now prevalent cannot be continued in rapid traffic-because of the imperfections in the cars, the differences in their dimensions, the constant repairs necessary by reason of their ridiculous cheapness of construction, so that they must be taken in for repairs at every large terminal station. The want of interchangeability of the parts in use upon the cars of one road with those in use upon the cars of any other road renders a delay in procuring suitable parts for repairs one of the reasons why the ordinary car makes such a limited mileage while away from home. To a mechanic it is only wonderful that it is able to get home at all. It is only because of the superior condition of the tracks of most of the lines that such great loads can be carried with so few disasters, in comparison with what might be expected to occur, when the shiftless character of the cars, especially of their trucks, is taken into consideration.

If the trunk lines, with their connections, undertake the construction of these improved cars with which to make really rapid freight lines, they will by degrees decline to receive the inferior equipment to which we have referred, gradually renewing their worn-out stock of inferior character by the construction of these superior cars, which it is clear they can well afford to do, since a car which transports a certain amount of freight 500 miles a day may properly cost eight or nine times as much as a car which can only take the same quantity of freight 60 miles per day.

When the main trunk lines shall have accumulated enough of these improved cars to make a fair beginning, they will wish to keep an account of their movements with the same carefulness and accuracy which the express companies and sleeping car companies employ, and they will unite in a clearing house, or in some reasonable mode of keeping an account of the exact whereabouts of each car; because each car will be valuable enough to be looked after, instead of being satisfied, as they are now, with knowing that at a certain date the car was at a certain junction, trusting to good luck that it will turn up at some other junction at some future time. Under the proposed arrangements for *really fast freight*, the improved cars would not be delivered to roads which had not provided an equally excellent equipment, and the necessity for joining in the *really fast freight* movement being felt by them, they would ask leave to have similar cars built, to be introduced in the business of rapid freight transportation, uniform with those of the trunk lines; and it would soon come to be, as it was in the first establishment of the colored lines, that each road will be anxious to furnish its proportion of the cars in the line and to receive its proportion of benefit.

It would be judicious for the trunk lines adopting these rapid freight cars to give them an uniform distinguishing color and similar markings; the ownership of the cars, of course, being indicated in a proper manner.

The rate to be paid for the use of the improved cars should be a certain fixed sum, to be paid per mile run, and another sum to be paid for the time in use upon any road; and together the payments should be large enough to cover interest on the investment and a good profit on the cost of the car; so that there would be an inducement to outside roads to join the trunk lines in the furnishing of the improved equipment.

This might lead to the formation by the trunk lines and their allies of a grand "Improved Equipment Company," which should own all the "rapid freight" cars, to be governed by a clearing house having the absolute right to distribute them according to the needs of the companies, or according to their rights, as should be established by regulations among themselves.

It is probable that if the entire "rapid freight" equipment were so owned and controlled, it might be better employed than if each line or system were to own its equipment; but if the construction of such cars as we have recommended were once begun, we may presume that the laws of development would gradually evolve the most suitable arrangements to secure the best results.

The constant growth of the trade of the country would soon absorb the present inferior class of freight cars in the local traffic, so that as soon as the new cars could be completed and got ready for use in the "rapid freight" business, they should be, and would be, exclusively employed for the through business intended to pass over several roads, for, being absolutely the same in all essential details, no unusual delays for repairs would occur; and, being fitted with the continuous brake, they could be run in passenger trains, whenever that should be most convenient. In this way, many of the smaller lines in the country, which have no large passenger trains and which would have only a few cars daily of rapid freight, would unite the two services in one train, without danger or inconvenience.

We need not point out to managers of railroads which have lately been seriously annoyed by the strikes of brakemen, how very much to their advantage it would be if the cars for their rapid and important freight were equipped with a continuous brake and improved couplings, so that the skilled men who are necessary to run over the tops of cars and to couple them (when not equipped with automatic couplers) might be dispensed with, and men of very small experience substituted.

The reason why brakemen strike is because their places cannot be easily supplied; and these two improvements would make it very easy to provide substitutes for them if they became unreasonable. We noticed not long ago a strike of brakemen because it was required that one man should stay upon the top of the train. With these improved cars there would be no occasion for men on the tops of trains.

Finally, to recapitulate, the cheapest way in which

provision for rapid freight movement can be made upon our railroads, as they are, is to provide a first-rate class of freight cars suitable for rapid transit, equipped with continuous brakes and automatic couplers; and for the railroads to arrange to deliver all freight carried in such cars to the warehouses of the consignees, so that there shall be no delay in unloading; and this class of equipment may perhaps be best provided by a joint stock company, composed of the several railroads interested, and controlled by a clearing house; although in the absence of such a joint stock company, the trunk lines might unite in an agreement to build cars for rapid freight transportation, according to an adopted standard, so that all parts of any car on one road should be interchangeable with the same parts upon any rapid freight car of any other road. The results would be a profitable employment of the capital invested in the cars, and a very much improved system of freight transportation and delivery, all of which, it is submitted, are very much to be desired.

The Growth of Flour Exports at Baltimore.

We have shown elsewhere that Baltimore has had an unusually large share of the breadstuffs export trade since harvest. Examination shows that its gain has been very largely in flour, of which heretofore its exports have been small. For the four months ending with October, its exports have been, for four years:

	Flour, bbls.	Wheat, bu.	Corn, bu.	Value.
1886	714,208	6,534,949	273,599	$9,802,636
1885	203,257	1,493 693	591,240	3,384,322
1883	118,136	7,682,496	1,734,507	10,673,378
1882	169,625	10,851,558	14,247	14,882,567

Thus the flour exports this year were enormously greater than in any other, including years when the wheat exports were much larger than now. Indeed, the Baltimore flour exports were much larger in these four months this year than in any *entire year* heretofore, except last year, they having been, in barrels, for the whole years named below:

Year.	Barrels.	Year.	Barrels.
1876	426 094	1881	413,093
1877	364 381	1882	463,878
1878	592,766	1883	439,266
1879	393,748	1884	437,713
1880	483,891	1885	1,091,093

Thus, while our total exports of flour were increasing very largely, from an average of less than 4,000,000 barrels per year before 1879 to 6,000,000 in 1879, 7.1, 6.8 and 7.6 millions in the next three years, successively, and to more than 9 millions in 1883 and 1884, the Baltimore exports remained practically stationary, New York and Boston getting the chief benefit from the increase.

But Baltimore has been making up for lost time since 1884, in 1885 exporting more than twice as much as in any of the five years previous, and this year, for the ten months to the end of October, one-third more than last year, namely, 1,318,731 barrels, against 990,688, while the total exports of the United States have been *less* this year than last. Of the exports of the Atlantic ports for the ten months, 20 per cent. went from Baltimore this year, against 14⅔ per cent. last year—a very notable change in one of our most important exports. The extent to which other ports have been affected may be seen by the following statement of the exports since June:

	1886.	1885.	Inc. or Dec.	P. c
New York	1,151,915	907.508	+ 154,407	15 5
Boston	896,398	547.305	+ 349,093	63.8
Philadelphia	125,821	112.226	— 13.595	12.1
Baltimore	714,208	203.257	+ 510.951	251.4
New Orleans	100 089	31.884	+ 68.205	214 0
Other At. Ports	197,625	261,179	— 63,554	24.3
Total At. Ports	3,186,056	2,153,359	+ 1,032,697	41.2

Thus very nearly one-half of the whole large increase in flour exports since June has gone from Baltimore, and every port which has not gained as much as 41 per cent., which is the increase in the total exports, may be considered to have lost to Baltimore. Thus it has gained at the expense of New York, Philadelphia and the unnamed ports, while Boston and New Orleans have gained greatly. The unnamed ports are nearly all lake ports, whose exports depend chiefly on the Canadian demand, which again depends chiefly on the quantity and quality of the Canadian crop.

The season has been much more favorable than last year to Baltimore, because there is a large crop of winter wheat in the territory where it has best command of traffic, and where there was none to spare last year; but the flour exports from Baltimore were nevertheless larger rather than smaller than usual for these four months last year. It had in the first half of that year exported unusually large quantities, drawn largely, doubtlessly, from territory which theretofore had exported but little by way of Baltimore. Indeed, much the larger part of the increase of its flour exports seems to be due to the delivery there by the Pennsylvania Railroad of flour which formerly was consigned by way of Philadelphia and New York. The Baltimore & Ohio Railroad brought to Baltimore in its year to Sept. 30 last 14,013 barrels *less* flour than the year before, and only 34,892 barrels more than in 1883-84, while the Baltimore exports in its last fiscal year were fully 900,000 barrels greater than in 1883-84.

We are mortified to find that the terms in which we noticed last week the stock dividend of the Westinghouse Air Brake Co. were by some taken to mean a reflection on the company—for making or expecting excessive profits, we suppose; for we do not see what else that is unfavorable the baldest and most literal interpretation of our words could make out of them. It seemed to us when we wrote, that it was universally known and acknowledged that Mr. Westinghouse's inventions were of such great value to the railroads and the community, that no one could or would complain that the rewards reaped, whatever they may be, were more than were earned, and that there at least was a case of "stock-watering" which the veriest Granger would not object to. But when we said that the "atrocious extent to which watering stock is often carried" had been illustrated in this case, our irony was lost on some good people, and by so many that we feel inclined to vow never to make a joke again. It is peculiarly mortifying to us that such an interpretation should have been put upon our words, because a somewhat intimate acquaintance with the many inventions of the head of this company and of his extraordinary skill in mechanical design, shown in hundreds of cases little known to the public, led us long ago to regard him as one of the most brilliant ornaments of an age remarkable for mechanical genius, worthy of all honor and the most munificent rewards. We do not know, nor care to know, how much has been realized from his inventions, but among the many great fortunes acquired in this country during the present century we doubt if there is one which has been better deserved, or for which an equivalent has been more fully rendered. We should as soon complain of a fortune made by Watt or by Stephenson.

We learn from a private letter indorsing the suggestions which we made in reference to the Rio disaster, its cause and cure, that a happy result of that dreadful occurrence has been a marked increase in inquiries as to distant signals. "The blood of the martyrs is the seed of the church" in mechanical as well as spiritual matters. Nothing less than some severe and peremptory warning will ordinarily suffice to drive people, who already have their hands tolerably full with keeping things going as they are, to venture into new and untried fields of further improvement; nor is it to be wondered at so much as it is to be regretted.

But in this case the lesson is clear and plain. There is no reasonable excuse for continuing to use stub switches on main lines of any considerable traffic, nor in leaving any main line switch which is passed over by any considerable number of trains, daily unprotected by some form of distant signal. If a road be not prepared to go to the expense of regular interlocking apparatus, which is what they will all have to come to eventually, if there is any truth in the lessons of experience, they can at least put up signals which can in all cases be seen from a reasonable distance, or use some cheaper substitute for the ordinary form of interlocking, such as that devised by Mr. Isham Randolph, Chief Engineer of the Chicago & Western Indiana and Belt Railroad of Chicago, and now in most successful use on that line. This apparatus was partly described in our issues of Feb. 13 and March 20, 1885, and is well worth a visit of examination.

The articles of incorporation of the Chicago, Kansas & Western Railroad Company in Illinois, which is to build the Atchison, Topeka & Santa Fe's proposed Chicago line, describe two distinct lines from the Mississippi opposite Fort Madison, which is about half way between Burlington and Keokuk, northeastward to Chicago. One of these lines would be parallel to and a few miles north of the Chicago, Burlington & Quincy, and the other parallel to and a little south of the same road, these being apparently alternative routes. Another line described is from near the western terminus of the Chicago line eastward through Peoria to the Indiana line, near the Chicago, Burlington & Quincy, to Peoria and parallel to the Toledo, Peoria & Western for its whole length. Branches from near the western terminus are described to the following Mississippi River towns: Keokuk, Muscatine, Rock Island and some point in Henderson County, probably opposite Burington.

If the southern route to Chicago should be taken, the line would lie for much of the distance between the Burlington and the Rock Island, much as the Milwaukee & St. Paul's Council Bluffs line in Iowa lies between the Northwestern and the Rock Island, and it would hurt them both. If the northern route is taken, it will for most of the distance have Chicago, Burlington & Quincy lines on each side of it, and will affect it chiefly. It cannot fail on either route to divert a considerable local traffic from existing railroads, but if, as seems from the description in the articles of incorporation, it is for the most part a few miles from existing roads, it will not get a great deal. Railroads are already so close together in Northern Illinois that considerable new towns cannot be developed on new railroads between them, and a very large part of the farm produce will be hauled five or six miles to a considerable town and market, rather than two or three miles to a station where are very few buyers of produce or sellers of goods. To get the maximum amount of traffic for a new parallel railroad, it would probably be better to build it directly alongside of the old railroad and through all the towns that have grown up on its line rather than four or five miles to one side. That there would be more *profit* from the first-named location is not so certain. The situation would be favorable for destroying profits, as the history of the West Shore proved. The Atchison's proposed Chicago line is a sort of West Shore for the Chicago, Burlington & Quincy. The local traffic between Chicago and Burlington, however, is not nearly so great as that between New York and Buffalo, nor is it nearly so large a proportion of the Chicago, Burlington & Quincy's total traffic as the New York-Buffalo traffic is of the New York Central's traffic. But it is about as large as on any line of equal length west of Chicago, and the diversion of a large part of it will hurt. It is unfortunate that some arrangement could not be made to obviate the building of the new road. It is not at all needed to provide for the transportation of the country—no more than the Chicago, Burlington & Northern was; and its inevitable effect will be to increase the *cost* of transportation, by carrying traffic for which lines already built are more than sufficient, which will result either in preventing a reduction in the *price* of transportation, which otherwise would occur as traffic grows, or in reducing the interest on the capital invested in the railroads.

An advance in the basis of east-bound rates from the 25 cents per 100 lbs. on grain and flour from Chicago to New York, which has prevailed for more than a year, to 30 cents has been recommended by the Central Traffic Association, to take effect Dec. 1. We doubt much whether such an advance will be wise. It is true that a regular winter rate as low as 25 cents was never made until last year, and that an advance after navigation closes is proper, circumstances being favorable. But grain is very low now; the only large stocks in elevators are of wheat, which can be held without difficulty until navigation opens in the spring, and it is questionable whether there would be a considerable movement at a 30-cent rate. The strict maintenance of a 25-cent rate would be equivalent to an advance probably of 10 per cent. over the actual receipts since navigation opened. On the other hand it may be said that the movement through to the seaboard is now but a small part of the whole movement, that a 30-cent rate on the movement to interior Eastern points which is governed by the through rate is a very moderate one and will be paid by the consumer instead of the producer, and that it is possible that the greater activity of business will make the supply of cars short, and thus virtually compel an advance. We doubt if this latter is true, and we believe that while the farmers are suffering so much from the very low price of their produce the railroads, as a matter of policy, should try to help them out by accepting very small profits on this freight. The whole effect could be produced, we believe, through a rebate on exports; but that the railroads seem disinclined to undertake.

Leading Exports in October.

The values of the exports of cotton, flour, grain, provisions, dairy produce, live cattle and petroleum in October and the four months ending with October for the last three years have been:

	1884.	1885.	1886.
October	$53,096,920	$52,764,973	$51,195,184
Four mos. to Oct. 31	156,240,834	143,115,220	148,570,844

For October the value was a little less this year than in the two previous, and for the four months it was 11.6 per cent. more than last year, and 5 per cent. less than in 1884.

BREADSTUFFS.

The exports of grain and flour in October were 11⅔ per cent. greater this year than last, and greater than in most recent years, but less than in several years previous to 1880,

the bushels of each of the chief grains, and of flour reduced to wheat, having been:

Year.	Flour.	Wheat.	Corn.	All grain.	Value.
1881	1,509,736	7,340,702	4,974,661	13,996 859	$14,839,914
1882	2,879,316	10,043 247	1,005,775	14,197 425	15,362,682
1883	3.470.787	6 587,728	4,845,371	15,569,352	14,651,530
1884	3.964,909	7 374.966	1.169.647	14 385 352	11,772.206
1885	3,634,258	3,878,616	4.413,954	13,334,806	10,232,285
1886	4,123,080	6,941,370	3,292,508	14,888,766	11,646,268

Taking flour and wheat together, the exports this year were 11,064,450 bushels, which is 47 per cent. more than last year, but less than in 1884 and 1882, and a tenth more than in 1883. The flour exports were the largest ever made in October. The corn exports were a fourth less than last year, and less by still greater amounts than in 1883 and 1881, and also in every October for five years previous to 1881.

The six years in the above table come after the period of heavy grain exports, as will appear by the following statement of the flour, wheat and corn exports in October for the five years ending with 1880 :

Year.	Flour.	Wheat.	Corn.	Flour, wheat and corn.
1876	1.703,355	6 973,497	5,780,908	14,460,760
1877	1,523,673	11.657,290	4,388,427	17,569,390
1878	2,185,816	11,908,405	4.525.222	18.619,443
1879	3,012,961	20.269,856	5,682,187	28 995.004
1880	2,909,529	15,972.867	8,536,225	27,418,621

Thus in every one of these years, except 1876, the exports of flour, wheat and corn were much greater than the exports of all grains this year. It is important to understand that in the prosperity which we are now having and which seems to be increasing and likely to increase for some time to come, the exports of our surplus breadstuffs are playing no such part as in 1879 and later, when not only were exports very much greater, but prices were higher.

For the four months since June the flour, wheat and corn exports have been in bushels:

Year.	Flour.	Wheat.	Corn.	Total.
1876	5,187.743	18,306,895	25,562,137	49,056,780
1877	6.385.153	47,533,110	22,273,340	76.191,603
1878	8,088.718	66,227,586	25,761,487	100 077,791
1879	9.221 215	80,428,757	23 115 347	112,763,319
1880	10,555,474	69,813,240	40.108,349	120,477,063
1881	8 802,423	41,861,854	26,559,677	77,223,954
1882	11 876,751	58,655,814	2,243 858	72,776.423
1883	11,906,739	28,158,632	20 165,313	60,230,675
1884	13.690 318	36,225,427	6,785,725	56.701,470
1885	11,597,898	14,250.956	15,352,688	41,201,542
1886	16,609,860	35,393,804	10,723,802	62,727,466

The flour exports were much larger this year than ever before, but the wheat exports in ten years have been smaller only twice—last year and in 1883; while the flour and wheat exports together, though twice as great as last year and greater also than in 1883 and 1884, were 26½ per cent. less than in 1882, 35 per cent. less than in 1880, 42 per cent. less than in 1879, 30 per cent. less than in 1878, and not quite so great as in 1877 even.

With the corn exports the comparison is still more unfavorable, for they were smaller this year than in any other of the 11 except 1882 and 1884, and not half as great as in any of the six years from 1876 to 1881, and nearly a third less than last year.

For the last six years the exports of flour and grain of all kinds, and their value, in the four months ending with October have been :

Year.	Bushels.	Value.	Year.	Bushels.	Value.
1881	78,251,199	$80,311,635	1884	61,177,307	$54 294,662
1882	73,812,029	85,444,272	1885	45,951.382	35,671,759
1883	63,358,882	59,933,099	1886	63,955,167	52,615,731

Thus the value of the exports since the last harvest began to affect them, though one-half greater this year than last, was less than in any previous year in this table, and less than in any of the four years previous to 1881. The decrease since 1882 is no less than $32,828,000, or 38 percent.

The quantity of the exports, however, was larger this year than in any other since 1882, a very large part of the decrease in value having been due to lower prices. The increase in the quantity over last year is 39 per cent., but the quantity is nearly the same as in 1883 and 1884, and less than in the two previous years.

The greatest increase in exports since harvest has been at Baltimore, whose grain and flour exports were exceptionally light at this time last year. The Pacific coast has also increased its exports more than the average. The percentage of the total *value* of the breadstuffs exports *from the Atlantic ports* for the four months going from each port has been:

	N. Y.	Boston.	Phila.	Balt.	N. O.	Other.
1886	40.5	13.7	8.6	22.9	3.2	11.1
1885	52.3	14.2	8.5	11.4	2.1	11.5
1884	44.7	13.9	8.0	18.2	3.9	11.3
1883	45.5	11.5	6.5	21.6	4.0	10.9
1882	48.3	6.8	7.3	20.3	7.1	10.2

Thus the New York exports this year for the four months were the smallest and the Philadelphia and Baltimore exports the largest percentage of the total Atlantic exports they have been for five years. The gain of Baltimore is large only in comparison with last year, however, are with the exception of last year, the percentage of New Orleans is the smallest for five years.

PROVISIONS.

The provision exports last October show, in comparison with last year, an increase of 11 per cent. in pork products, but a decrease of 25 per cent. in beef and of 7 per cent. in dairy products, the quantities of pork products, beef, tallow and dairy products being 88¼ million pounds this year, against 84⅛ last year and 70¼ in 1884, while their aggregate values were :

Year.	Value	Year.	Value.
1881	$8,920,520	1884	$7.478,030
1882	4 662 626	1885	6,806,386
1883	8,32,8797	1886	6,751.017

Thus the value this year was a little less than last year, 10 per cent. less than in 1884, 19 per cent. less than in 1883, and 24 per cent. less than in 1881, but 45 per cent. more than in 1882, when there were scarcely any exports of pork products. These latter have been, in October, in *millions* of pounds :

1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
45.2	63.2	76.4	88.0	65.2	24.7	52.9	42.1	57.5	63.8

They were this year the largest since 1881, and were much exceeded only in 1879 and 1880.

For the 12 months ending with October, which is sometimes called the provision year, and represents quite accurately the exports of meats fattened by the corn crop of the previous year, the exports of pork products have been :

Year to Oct. 31.									
1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	
1,055.5	1,200.0	1,278.4	1,130.0	694.2	746.3	639.7	794.3	820 0	

Here, again, the exports this year are the largest since 1881, but they are much less than in any of the first four years.

The values of the provision exports (not including dairy products) for the 12 months ending with October have been :

	Beef and tallow.	Pork products.	Total.
1881	$24,170,796	$100 968,480	$125,139,276
1882	16 287,675	73,714,976	90,002,651
1883	23,491,185	79 421,328	102,912,513
1884	22.339 790	61,128,428	83,468,218
1885	22,277.015	63 649,154	85,926,169
1886	16,647.571	58,167.124	74,814,695

The value of the pork exports is smaller than in any other year since 1876, and the value of the beef and tallow exports was less than in any other year since 1879, except 1882. The decrease in the beef exports has been disappointing. It seemed a few years ago that, when the range cattle country was fairly stocked, we might enormously increase our exports, as Europe could consume twenty times our largest exports heretofore, if its people took one half the average consumption of our people, which they would certainly do if they could get it cheap enough. Now the range country is fully stocked, prices are painfully low to the producers, but our exports in the 12 months to Oct. 31 in 1881 and 1886 were :

	1886.	1881.	Decrease.	P.c.
Fresh beef	98,151,046	107,675,484	9,524,438	8.9
Salt beef	78,523,202	110,691,356	32,163 154	29 2
Tallow	45,077,982	75,686.825	28,608,843	38.8
Total lbs	221.757 230	293.053 665	70,296 435	24.1
Value	$16 647,371	$24,170,796	$7,523.225	31.1
Cattle, No	113,999	185,707	71.708	38.6
Value	$10,593,906	$14.304.803	$3,710.897	26.0

Thus instead of the great increase in the exports of cattle and their products which we had expected, there has been a great decrease since 1881. The reported value, however, has not fallen much, being for fresh beef 9.22 cents per pound last year against 9.45 in 1886 for the whole year, but 8.62 last *October*, against 9.05 last year in October, and 9.30 cents in the whole year to June 30, 1881.

COTTON.

The cotton exports last October were nearly the same in quantity as the year before, and 8 per cent. more than in 1884, but the value of the exports was 6 per cent. less than last year, and very little more than in 1884. For the two months of the crop year ending with October the exports have been :

	1884	1885.	1886.
Pounds	368,640 862	357,156,000	371.838 247
Value	$38,577,758	$36,622.861	$35 595,918

The quantity this year was 4 per cent. more than last year, and a little more than in 1884, but the value was 2¾ per cent. less than last year and 8 per cent. less than in 1884.

New Orleans exported 25.6 per cent. of the total cotton exports last October, and Galveston came next to it with 19.4 per cent., New York with 14.2, Savannah with 13.2, and Charleston with 10 per cent. No exports are reported from Mobile. Norfolk, which ships a great deal of cotton, does not export much, it, Richmond and Yorktown together being credited with 15,084,073 lbs., or 5 per cent. of the whole, while all the South Atlantic ports together—all south of Baltimore—exported 98 millions of pounds, or 33 per cent. of the whole, while 134 millions, or 45 per cent. of the whole went from Gulf ports, the other 95 millions going from the North Atlantic ports.

The Packing Season.

The full report of the packing of hogs in the Northwest for the "summer season," March 1 to Oct. 31, gives the total as follows :

	1886.	1885.	Increase.	P. c.
No. packed	5,641,505	4,964,572	676,933	13.6

The increase is much less than the current weekly reports, which include only the chief packing towns, indicated some time ago. The number, however, is larger than in the summer season of any previous year, the numbers in the winter and the summer season, and the corn crop, having been for 14 years :

	Number of hogs packed.			Corn crop.
Year to Oct. 31.	4 mos. to Feb. 28	8 mos. to Oct. 31.	Year to Oct. 31.	Millions of bu.
1872-73	5,410,314	1,062,916	6 473,230	1,092.7
1873-74	5,466 200	1,200 444	6.666 644	932.3
1874-75	5,566,226	1.262 543	6,828,569	850.1
1875-76	4,880,135	2,307,866	7,188,001	1,320 1
1876-77	5.101.308	2,543,120	7.644,498	1,283.8
1877-78	6,505,444	3 337,044	9,842,490	1,409.0
1878-79	7.480 648	4,051.248	11 531,896	1,549.0
1879-80	6.950.451	5,323.898	12.274,349	1,754 9
1880-81	6,919.456	4,803,689	11,723,145	1,717.4
1881-82	5,747.760	3.210 787	8,958.547	1,194.3
1882-83	6,132,212	3.770,828	9,903.040	1,617.0
1883-84	5,402 064	4.058.868	9 460.932	1,551.0
1884-85	6,460,240	4,954,572	11,424 812	1,795 5
1885-86	6,298,895	5,641,505	11,940,000	1,936 0

The largest summer packing previous to this year was in 1880; the winter packing of 1879-80 was 652,000 more than last winter, but the summer packing was 318,000 less. The packing for the last entire year was thus exceeded slightly (3 per cent.) in 1880, but was equaled in no other year. The increase over 1884-85 is 515,000, or 4½ per cent., and over 1883-84, the last of the four light corn crop years, the increase is 2,479,000, or 26 per cent. This is a very large increase, yet hardly what was to be expected in view of the greatness of the last two corn crops. It was not surprising that the packing of 1885 should not equal that of 1880, because four successive light corn crops had greatly reduced the stock of hogs, but two years is time enough to replenish the stock, and the second large corn crop gave a motive for doing it. But actually near four-fifths of the increase from 1884 to 1886 was made from 1884 to 1885:

We see that the summer packing now is not very much less than the winter packing, and that the proportion of the whole packed in summer tends to increase. The percentage packed in summer has been:

1875.	1877.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
18.5	33.2	35.1	43.4	41.0	35.8	38.0	42.9	44.4	47.2

There are several places where there is much packing in winter but very little in summer. The numbers of hog packed during the summer season at the different places for the last five years have been :

	1882.	1883.	1884.	1885.	1886.
Chicago	1,664,977	1,900,408	1,859 988	2,535,678	2,603,000
Kansas City	368,460	588 298	624,361	814,640	864,000
Milwaukee	112,000	103 420	172,304	228 780	225,000
Indianapolis	112,400	196,117	222,067	191.800	317,000
St. Louis	215,176	225,000	269,814	244,004	370,000
Cincinnati	81,916	124,183	127,581	134 768	145,000
Louisville	17 581	28,731	45,302	50,715	56,000
Cedar Rapids	170,289	184,162	192,661	195,727	243,788
Cleveland	150,421	117,631	105,000	144,424	200,000
Ottumwa	58,571	51 500	83 833	79,522	93,900
Keokuk	12 847	27,008	37,950	52 234	58,150
Sioux City	37,462	46 820	40,396	51,768	.....
Des Moines	22,735	21,350	33,466	20 477	41,500
Dubuque	.....	.....	.....	.....	50 000
Marshalltown	.....	.....	.....	.....	25,000
Nebraska City	.....	10 000	60,000	75 000	31,000
Omaha	60,068	49,000	30,000	35 000	38, 92
St. Joseph	20,000	17,000	30,784	19,958	30,000
Atchison	.....	.....	.....	.....	20 500
Detroit	35,925	33,655	48,863	58,983	55,400
Other places	69 982	59 000	74,498	31,496	78,475
Total	3,110,787	3,770,828	4,058,868	4,964,572	5,641,505

Compared with 1880, the increase or decrease in the summer packing at the leading packing towns has been :

	1886	1880.	Inc. or Dec.	P. c.
Chicago	2 660.000	2 971 127	— 371,127	12.5
Kansas City	979,000	239 720	+ 729,280	304 0
St Louis	370 000	4 0.000	— 40,000	9.8
Indianapolis	307 000	383,165	— 76.165	19 9
Cedar Rapids	243 788	259.6 5	— 15,867	6.1
Milwaukee	225 009	136,619	+ 88.381	64.6
Cleveland	200,000	324 440	— 124,440	38 4
Cincinnati	145 000	110,556	+ 34,444	31.1
Atchison	20,500	223,447	— 202,947	90.8
Other places	261,217	265,169	— 3,9.2	1.5
Total	5,641,505	5,343,898	+ 317.607	6.0

There has been an important gain nowhere except at Kansas City, which packed four times as many this year as in 1880. Its gain has been the greater because of its absorption of the Atchison business, the establishment which packed there in 1880 having moved to Kansas City the next year, and left Atchison without any summer packing until this year. But if we take all the "Missouri River points" together, Kansas City, St. Joseph, Atchison, Nebraska City and Omaha, we find them packing 1,087,692 hogs this year against 463,167 in 1880, which shows that the packing houses have gone to meet the increasing corn crops of Kansas and Nebraska, which were 171,180,000 bushels in 1879 (with which the hogs packed in 1880 were fattened), and 287,816,000 last year. The whole number packed west of the Mississippi was 1,937,539 this year, against 1,189,348 in 1880; while the number packed east of the Mississippi decreased from 4,134,550 in 1880 to 3,673,936 this year. The increase west of the Mississippi has been 778,221, or 65 per cent., while the decrease east of the Mississippi has been 460,614, or 11 per cent.

The very light corn crops previous to 1884, except in Kansas and Nebraska, made it possible that the growth of the packing there had been relatively unnaturally large; but since after two good corn crops east of the Missouri the growth continues much faster there than elsewhere, it is made probable that the packing east of the Missouri has reached its maximum, and that Chicago, like Cincinnati long ago, will cease to make progress in this industry, and possibly may pack fewer hereafter than it has heretofore, though as no great packing place except Kansas City has been developed west of Chicago (even Cedar Rapids packing fewer this year than in 1880), Chicago seems likely to preserve its pre-eminence, and its relative importance among packing towns east of the Missouri. And while the Kansas City packing is likely to increase for some time to come, it is almost impossible that it should ever pack as many as Chicago has for many years, because the corn and hog-growing country from which it draws its supplies is very much smaller than that which supplies Chicago. If the corn fields could be made to extend all over the Indian Territory and as far west as the Rocky Mountains, then Kansas City might do as much as Chicago, but in the semicircle to the west drawn from Kansas City as a centre with a radius to Denver, probably not one-fourth of the land is available for corn growing.

This year is the second year that less than half of the summer packing has been done at Chicago. In 1880 it packed 55.8 per cent. of the whole number, in 1881 54.2 per cent., in 1884 45.8, in 1885 51.1, this year 46.1 per cent. But Kansas City packed 17.2 this year, against 4.5 in 1880, 9.5 in 1881, 15.6 in 1883, and 16.4 last year.

While the packing this year was larger than in any other except one, the exports of pork products were very much less than in the years previous to 1880, as we have shown elsewhere. The packing in the year just completed was 21⅛ per cent. more than in 1878, but the exports were 22½ per cent less. The packing was a little greater than in 1881, but the exports were 27½ per cent. less. This is one of the things that go to prove that the home consumption has enormously increased with the past four years.

The First Locomotive for America.

During a recent visit to England, we paid a visit to the works of Robert Stephenson & Co., at Newcastle on Tyne,

and were kindly allowed to look over many of their old books and drawings giving particulars of the earliest locomotives.

The following verbatim extract from the "Description Book, 1831" gives the leading dimensions of the first engine ordered for use in the United States. The description was probably copied from an older book, and was apparently written in 1831. Mr. Allen has stated that he believed this engine, which he ordered from Stephenson, to have been the first with a multitubular boiler, as distinguished from the older engines with a single or a return flue. While Stephenson had faith in the multitubular boiler, he could not persuade his countrymen to order a boiler of the new type, but Horatio Allen, with characteristic American disdain for mere precedents, gave Stephenson an order for the first multitubular boiler used in a locomotive. It will be seen, however, that this boiler hardly deserved the name of multitubular, as it had only two so-called tubes, each 19 in. diameter. Mr. Allen has stated, however, that "the only points decided by me were that the boilers of the locomotives built by Stephenson & Co. were to be multitubular boilers, the dimensions of the tubes to be decided by the builders."* Mr. Allen further states that the engines were built after he left England, and that he never saw the inside of the boilers. Stephenson appears to have had less confidence in the multitubular boiler than Mr. Allen, and therefore built the boiler with two flues instead of numerous tubes. The following is a verbatim copy of the description:

"No. 12, Allen's engine constructed 1828:

Boiler	4 ft. 1 in. × 9 ft. 6 in.
Fireplace	4 × 3
Cylinders	9 in. × 2 ft. 0 in.
Chimney	1 ft. 8 in.
Pumps	1½ in. × 2 ft. 0 in.
Wheels	wood
Diameter	48 in.
Number	4
Angle of cylinders from the horizontal	33°
Size of tubes	1 ft. 7 in.
Number	2

Straight."

This was the twelfth engine built by Stephenson. The nineteenth was "the 'Rocket,' Liverpool prize engine, constructed 1829."

The seventeenth was constructed for Major Whistler, and was somewhat similar to Horatio Allen's engine, but had six wheels and a return flue.

The "Rocket" is described as follows in the old "Description Book" referred to before:

"Boiler	3 ft. 4 in. × 6 ft. 0 in.
Fireplace	2 ft. 7 in. × 2 ft. 0 in.
Cylinder	8 × 17
Chimney	1 ft. 2 in.
Pump	1¼ × 17
Wheels, two	4 ft. 8 in.
Wheels, two	2 ft. 6 in.
Angle of cylinders from the horizontal	35°
Weight without water	3 tons 9 cwt.
Weight of water	13 cwt.
Tubes	copper.
Size of fire tubes	3 in.
Number	25
Circumfereace	9.424
Area	7.068 sq. in.
Distance centre to centre	4½ in.
Cylinders, centre to centre	5 ft. 9 in.
Wheels, centre to centre	7 ft. 2 in.
Depth outside from bottom of boiler to bottom of fire-box	1 ft. 3 in.
Super area tubes	13 sq. ft.
Axles, diameter in middle	3¼ in.

Single slide valve.
Observations.
Outside horizontal cylinders."

The "Rocket," therefore, in spite of Mr. Horatio Allen, appears to have been the first multitubular locomotive. Mr. Allen's possibly was the first in which two large straight flues were used instead of a single or a return flue.

A memorandum dated July 23, 1828, made apparently by Mr. Allen, evidently refers to the sharpest curve on the line on which his engine was to travel: "Sharpest curve on main line sine to chord is 1:60."† The chord was presumably the wheel-base of the engine, but the whole entry appears somewhat vague, and only shows that the question of passing round a curve had been considered.

The old drawings show that several points about locomotive practice are of older date than is generally imagined. The following shows the earliest dates at which the several devices named appear in the drawings:

Driving axle-box wedges	about 1831
Cylinders inside, centre line being below front axle	1831
Circular slide valves	1832
Deflectors in front of tubes	Engine "Goliath" 1835
Cock placed in bottom of exhaust-pipe to diminish violence of exhaust	Engine "Goliath" 1835
First link motion	1842
Four-cylinder engine, similar to Shaw's and Haswell's.	1848

At the time of our visit, Messrs. Stephenson's works were almost wholly engaged on marine engines, and the amount of locomotive work in the shops was limited to three or four locomotives and some duplicate parts. The contrast between perhaps the best known English and American locomotive builders was striking: while Baldwin's are fully employed, turning out 650 engines per annum, Stephenson's are nearly idle. It is, however, only fair to say that the Newcastle works are far smaller and have for many years done a steady business in marine engines. Their greatest output in any one year has been 72 locomotives. To judge from looking over their books and old drawings, more than one-half of the total number of engines built have been exported to nearly every part of the globe.

The lake shipments of grain from the Northwestern markets became comparatively small before the end of October. They averaged 3,174,000 bushels per week in August, 3,096,000 in September, 3,362,000 in the four weeks to Oct. 23, 2,285,117 in the last week of October, and 1,816,181 in the first week of November. Lake shipments usually decrease towards the close of the season, but the decrease has begun a little earlier than usual this year. This is due chiefly, probably, to the demand for vessels to carry ore.

An accident of no very serious nature, but a not uncommon one, and one so easily avoided that it is worth especial attention, is referred to elsewhere in this issue. The engineman of a train approaching a station at which it was not to stop saw what he supposed to be the tail-lights of another train ahead wrongfully on the track, reversed the engine, knocked out a cylinder-head, and knocked things around generally on the engine—all because a train safely on the side-track showed red tail-lights, the same as if on the main track.

On the Pennsylvania and other lines a shifting or reversible tail-light is used, which shows red when the train is on the main track and, by a quick turn half-way round, is made to show green when the train is on a side track. This is plainly correct in principle. The tail-lights are a danger signal, and it is training men in negligence to have danger signals regularly displayed along the line. Rather than do this, it is better to take away the tail-lights altogether when on side track, as some roads do. But as it practically costs nothing but a general order to avoid what is beyond doubt a real danger in several ways, as this incident shows, it is difficult to see why so simple a precaution is so generally neglected. The next time the engineer who knocked out his cylinder head, as above, sees a red tail-light in front of him, he may conclude that a train which is on the main track is on the side track, and his last state will be worse than the first.

The explosion of a new locomotive boiler built by a firm of the highest reputation is fortunately a very rare occurrence, and when such an accident befalls an engine drawing a fast express train on a great trunk line, some astonishment is natural, and considerable curiosity is manifested to know the cause. The great majority of boiler explosions are caused by corrosion or furrowing having so weakened the plates that in one particular spot they are unable to stand the working pressure. The amount of corrosion in a boiler only one month in use must, however, be infinitesimal, and we must look elsewhere for the cause. Either (1) the design of the boiler was very faulty, or (2) the material or workmanship was defective, or (3) the boiler was not worked with proper care, or (4) the explosion was caused by some hidden defect the existence of which could not be detected.

The explosion we refer to occurred Sept. 27 to an engine with a Wootten fire-box, built by the Baldwin Locomotive Works for the Baltimore & Ohio Railroad. The engine was running a fast express train when the explosion occurred. No one was killed, but the engineer, fireman and a brakeman were very badly injured and two passengers were hurt. The tender and several cars were injured and pieces of the boiler were thrown 100 yards from the track.

Several hundred engines have been built with the Wootten fire-box, and, therefore, it is hardly probable that the explosion could have been caused by faulty design, and the reputation of the Baldwin Locomotive Works stands too high to admit of any doubt as to the excellence of the material and workmanship used in making the boiler. Although the Baltimore & Ohio authorities preserve considerable reticence as to the exact cause of the explosion, we understand they admit it was caused by injudicious handling and not by any fault in design, material or workmanship. Shortness of water will cause the failure of any locomotive boiler. Safety plugs, if carefully made in the first instance, and taken out and examined frequently to make sure that the fusible metal is not covered with incrustation, should do much to prevent any explosion from shortness of water. Fusible plugs, however, are frequently inoperative when wanted, and on the other hand often are blown down when there is plenty of water above the fire-box crown. These shortcomings have brought safety plugs into disrepute, but a little care in the construction of the plug and the choice of a good fusible metal will give good results when the plugs are regularly examined at intervals and the incrustation removed, and the fusible metal renewed.

There can be no doubt that the presence of two men on the foot-plate, each having the gauge glass in full view, is a great safeguard against low water. In the Wootten and many other modern engines, the cab is placed entirely above the fire-box, and consequently the engineer has not so clear a view of the gauge glass and cannot form so correct an idea as to the quantity of water in the boiler. The regulation of the feed must then be left entirely in the hands of one man, and if he commits an oversight and allows the water to get too low, the other man cannot so clearly see and correct the mistake. This is one of the great disadvantages of separating the two men occupying the most responsible post on the train. On an ordinary locomotive each man can assist the other; the experienced runner can instruct and overlook a new fireman, and an active young fireman can assist an old runner in keeping a bright lookout or in pulling up a stiff-working reverse lever. It does seem possible that had the two men been together on the Baltimore & Ohio engine that the low level of the water in the boiler might have been detected in time and the explosion prevented.

A signal to brakemen, from the engineman, other than the usual whistle signal, is shown by the practice of some roads at grade crossings to be a desideratum; and with interlocking signals will virtually be a necessity in the near future. As an extra precaution the rule is made that where grade crossings are to be passed without stopping, the hand brake is to be applied by the trainmen so as to stop the train every time, regardless of the signals, unless the engineman signals all clear (after he has seen the signal). In practice, of course, the road is generally clear, so that nearly every engineman announces his presence in the vicinity to the surrounding dwellers by a couple of ear-splitting blasts; and if he happens to be from force of circumstances or from taste in agreement with the Time Convention committee's view that long blasts are better than short ones, he will quite likely make a finished job (if it be midnight) of waking all the tired people in the neighborhood. Indeed, in the case of long passenger trains, in a windy night, where the surroundings are not favorable to the rear brakeman's hearing the whistle, a long and loud blast may perhaps be the only effective way of getting him to release his brake. Whatever good reasons there may be for preferring long to short blasts for this signal, there can be no question that where the whistling has to be done near dwellings occupied by "a critical public," the shorter the blasts the better for the peace of mind of the superintendent; and if there are, as on some roads (the New York, New Haven & Hartford, for instance), drawbridges or crossings in or near populous towns, where a large number of trains must use this signal every day, great relief can be afforded to all concerned by the use of some simple train signal on passenger trains at least; freight could use the hand or lantern motion signal. Several—perhaps all—of the electric and pneumatic train signals profess to have feasible plans for signaling from as well as to the locomotive, we believe; but they could, we think, introduce a desirable modification by arranging a visible signal instead of an audible one for the brakeman's end of the line. For this particular purpose such a one would be peculiarly fitted, for if the brakeman should forget to look or the apparatus fail to work, no harm could ensue; and the absence of noise would conduce to the mental serenity of "passengers and all hands."

The general subject of noisiness of signals is still far from satisfactorily settled, and, from present indications, apparently will not be "downed" for a good while yet. The wide use of the ——— ——— – – highway signal develops the fact that enginemen who "have no music in their souls," and consequently cannot tell the difference between ——— ——— – – and – – ——— ——— are indigenous to all climes; and the still larger number who cannot control their nerves well enough to make the signal in less than four to six seconds, leaves plenty of opportunities for superintendents to find occasions for a little familiar conversation with their runners whenever they desire to make a slight forward movement toward perfection. Such of these officers as have influential directors who reside near a much used whistling-post on the line will do well to ponder some of these little points.

An experimental trip was begun Oct. 16 with a train of improved stock cars, built by the Ensign Manufacturing Co., of Huntington, W. Va., under the patents of its Vice-President, Mr. F. E. Canda. These cars are equipped with the American Brake Company's brake, the Hein coupler and the suspension truck. The cars are 39 ft. long, and weigh about 28,000 lbs., while ordinary stock cars are 34 ft long and weigh about 22,000 lbs. The Ensign car is provided with flexible partitions, something like the familiar flexible desk covers, which are let down from the roof after the cattle are loaded, dividing the car into eight compartments, with two cattle in each. There is a rack for hay and a trough for water on each side of every compartment, made to fold up against the side of the car when not in use. Water is supplied either from a tank carried under the car, or from a tank on the road, and the cattle can either lie or stand.

The train which started from Chicago Oct. 26 had 22 of the Ensign cars, equipped as above described, and three ordinary stock cars, the latter taken in order to compare the effect of the two vehicles on the cattle.

The train reached New York 61 hours after leaving Chicago, the usual halt having been made at Buffalo, in order to rest and feed the cattle in the common stock cars. With solid trains of the improved cars it is intended to run through without stopping in 42 to 48 hours. All the braking was done with the American power brake, and one "emergency stop" was made to avoid what seemed to be danger of a collision. Mr. Canda reports that the performance of the brake in this case and on other occasions, both in quick stops and in handling the train, was altogether satisfactory, and that the cattle were not appreciably affected even by the emergency stop, which indicates that close coupling may have greatly improved the action of this buffer brake.

The effect on the cattle is reported as follows, the weights in pounds of four car-loads in each kind of car, when shipped from Chicago and when delivered at New York having been:

Total:	Chicago.	New York.	Shrinkage,	P. c.
Ensign cars	90,630	88,480	2,150	2.38
Common cars	86,950	83,260	3,690	4.27
Per animal:				
Ensign cars	1,416	1,382½	33½	2.38
Common cars	1,359	1,301	58	4.27

This shows a saving in shrinkage of 1⅞ per cent. in the whole weight of the cattle carried in the improved cars, amounting to 424 lbs. per car-load, the value of which is a considerable fraction of the freight charge, and it is claimed that the average quality of the meat is enough better to make the cattle command a higher price.

In one case where only half the partitions were let down, leaving four cattle instead of two in a compartment, the loss in weight is reported as 25⅛ lbs. each where there were four against 13 lbs. each where there were two.

In an article describing two recent serious accidents from runaway trains, caused by accidentally "kicking" them backwards at the top of a grade when backing up to couple

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* See article by Mr. Horatio Allen, "The First Five Years of the Railroad Era," in the *Railroad Gazette*, April 4, 1884.
† This is equal to a 7 deg. 38 min. curve

on, *The Engineer* says "the hand brake had been applied, but was, *of course, no use on falling gradients of* 1 *in* 120 *and* 1 *in* 91." As these grades amount to only 44 and 58 ft. per mile, such an assertion reads curiously to Americans, and indicates that there is something more to reform in English brake practice than in substituting automatic for non-automatic power brakes. Every American passenger car or train is readily controllable by its hand brakes alone on far steeper grades, and not only so, but we may safely surmise that they are controlled by them in numerous instances every year, under more or less analogous circumstances, to the avoidance of what would otherwise be serious catastrophes. In dwelling upon the great safeguard which an automatic brake is under such circumstances, however, *The Engineer* is, of course, right, and as such runaways are particularly liable to occur with freight trains, the advantage of having the whole train instantly controllable by a man, or any part of it, or self-controllable in case of a broken coupling, would perhaps save more lives in the end on freight trains than on passenger trains.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

Batesville & Brinkley.—Extended from Newport, Ark., north to Jacksonport, 4 miles.

Carolina Central.—Extended from Ellenboro, N. C., west to Second Broad River, 11 miles.

Charleston, Cincinnati & Chicago.—Track laid from Black's, S. C., northward, to near Shelby, N. C., 14 miles.

Chateaugay.—Extended from Lyon Mountain, N. Y., westward to Loon Lake, 16 miles.

Chicago & Northwestern.—The *Maple River Branch* is extended west to Onawa, Ia., 12½ miles. The branch from Lake City, Ia., to Wall Lake Junction is 2 miles longer than heretofore reported.

Denver, Memphis & Atlantic.—Extended west to Tyro, Kan., 8½ miles; also from Kingman, Kan., east to Penelosa, 12 miles.

Florida Midland.—Track laid to a point 25 miles southwest from Lake Jessup, Fla., an extension of 19 miles.

Gulf, Colorado & Santa Fe.—The *Dallas Branch* is extended from Celeste, Tex., northeast to Wolf City, 8 miles. On the main line between Fort Worth, Tex., and Red River, 17 miles additional are reported.

Kansas City, Memphis & Birmingham.—Extended eastward to New Albany, Miss., 14 miles, and west to Wallerville, Miss., 3 miles.

Los Angeles & San Gabriel Valley.—Extended eastward to Duarte, Cal., 1¼ miles.

Pennsylvania.—The *Schuylkill Valley Division* is extended from Pottsville, Pa., to New Boston, 12⅕ miles.

Southern Pacific.—The *Northen Division* is extended from Paso Robles Hot Springs, Cal., southward to Crocker, 14 miles.

Taylor, Elgin & Bastrop.—Completed from Taylor, Tex. southward to Elgin, 17 miles.

This is a total of 185¾ miles on 14 lines, making 5,670 miles reported so far this year. The new track reported to the corresponding date for 15 years has been:

	Miles.		Miles.		Miles.
1886	5,670	1881	6,649	1876	2,102
1885	2,364	1880	5,342	1875	1,150
1884	3,359	1879	3,150	1874	1,686
1883	5,600	1878	1,947	1873	3,350
1882	9,171	1877	1,945	1872	6,311

This statement covers *main track only*, second or other additional tracks and sidings not being counted.

NEW PUBLICATION.

Useful Things to Know about Steam Boilers. By G. B. N. Tower, late Chief Engineer, U. S. N., Supervising Inspector of the American Steam Boiler Insurance Co.

This luxuriously gotten out volume of 220 pages is published by the insurance company just mentioned, and, as might be expected from its source, is of a strictly practical nature, designed to spread abroad more generally a knowledge of the practical details of good boiler practice, and the nature of and remedy for the more common defects of design and of management. It is illustrated by colored plates, and should prove a very useful publication.

THE SCRAP HEAP.

Railroad Young Men's Christian Association.

The Detroit Association reports for the quarter ending Sept. 30, a total of 1,278 attendants at the Brush street rooms, and 1,008 at the Springwells rooms. At the latter 13 religious meetings were held, with a total attendance of 339 persons.

The association at Columbus, O., reports for October a total attendance of 1,011 at the reading rooms. The usual Sunday services were held, and were attended by 525 persons. Three cottage meetings had a total of 44 present. The library was well patronized and the files at the reading room were supplied with 476 papers.

Dynamite on the Truck.

A Pittsburgh dispatch of Nov. 11 says: "Upon the arrival at Dubois, Pa., of the mail train north on the Buffalo, Rochester & Pittsburgh Railroad to-day the car inspector, while passengers were getting on and off the cars at the depot, discovered three dynamite bombs and caps fastened under the springs of the rear coach. The bombs were carefully removed, and there were many pale faces among the passengers when they learned the terrible fate they had so narrowly escaped. The train starts from Punxsutawney every morning, and it is undoubtedly at that place that the bombs were placed under the springs, as it only makes short stops between there and Dubois. It is 20 miles from the place of starting, and how it was possible for a train to run that distance over short curves with that amount of dynamite and caps under the springs of a coach is a mystery. Thirty-four persons were in the coach, and had the accident occurred as intended the loss of life would have been very great. Suspicion points directly to no person as the perpetrator of this deed, but the matter will be thoroughly investigated by the railroad authorities and an effort made to bring the criminal to justice."

Taking Care of the Express Safes.

The United States Express Co., taking warning from the late robbery from an express car, has placed on its cars new fire and burglar proof safes, which are bolted to the car. The express messengers do not carry the keys or have the combination to the safes, and they cannot be opened by them or any one else on the train. They are only opened at leading stations by the station agent, who gets on the train for that purpose, and locks them again safely before the train leaves the station. By this arrangement all collusion between dishonest messengers and express robbers is prevented, and the safes cannot be forced open without consuming longer time than would be necessary to successfully carry out the deed.—*Cleveland (O.) Leader.*

Rather a Long Stroke.

Mr. Grimshaw has now in operation a pair of very fine tandem horizontal engines, the cylinders being 19 and 38 in., respectively, with 500 ft. stroke. The flywheel weighs 23 tons, the crank shaft being composed of Whitworth's patent compressed steel, and capable of transmitting 700 horse-power.—*Ironmonger.*

Honoring an Old Employe.

The officers and employés of the Boston & Maine recently made up by subscription a purse of $200 for Mr. Thomas Dodd, for many years crossing-tender at Mill street, in Salem, Mass. They further arranged for a reception to Mr. Dodd at the hall of the Young Men's Christian Association in Salem on the evening of Nov. 9, the 50th anniversary of his entering the service of the Eastern Railroad Co. The purse was presented to Mr. Dodd, and there was a supper and other speeches.

The Express Car Robbery.

In relation to the robbery of an express car on the St. Louis & San Francisco road (referred to on page 739, number for Oct. 29), when the robber secured over $50,000 in money, a St. Louis dispatch of Nov. 11 says:

"The evidence in the express robbery case, so far as made public, goes to prove that the messenger, David S. Fotheringham, was an accessory, or at least a willing victim, in the affair. Discrepancies in his statements to the detectives indicate that he knows more of the manner in which the robbery was planned and executed than he would like to have them know, and an expert penman, who was before the Grand Jury last Saturday, states that the three letters signed 'Jim Cummings' were written by one and the same man, and expresses his belief that that man was Fotheringham, and that he wrote them before the commission of the robbery. It now transpires that the messenger's trunk was searched soon after the robbery, and a number of sheets of paper were found covered with copies of the signature of W. J. Barrett, Manager of the express company. It is supposed that the messenger became able to forge this signature so that he might affix it to the orders which the robber presented which allowed him to enter the car. Altogether, it looks bad for the messenger."

A Singular Accident.

On the morning of Nov. 16, as a drove of hogs was passing over a bridge leading to Allerton's packing house in Chicago, the structure gave way and a number of the animals fell upon the tracks below and upon a passenger train which happened to be passing under the bridge at that moment. Some of the hogs were run over and killed while some broke through a car roof and fell into the car, much to the astonishment of their brethren who were occupying two seats apiece.

A Green Brakeman.

D., L. & W. trainmen of late have been enjoying much sport with a green brakeman who has not yet familiarized himself with the duties of his position. He was sent back by the engineer the other day to open a crossing. He accomplished his undertaking by tearing down panels of fence. He was next seen out on the pilot with a broom frantically endeavoring to brush the fog away from the head-light so the engineer could see the rails.—*Owego Record.*

Perhaps this is the same chap, who was sent ahead by a conductor on the Pa. & N. Y. road some time ago to cut the train in two. The conductor after waiting a reasonable length of time, also went ahead to see what the difficulty was, and to his astonishment found his new brakeman between two cars, hatchet in hand, cutting away at the link.—*Elmira Advertiser.*

A Superfluous Jaw.

Quite a sensation was caused on a train on the New York & Long Branch road the other day by one of the brakemen picking up a package in the car which contained the lower jaw of a human being. The brakeman hastily threw it from him, and soon imagined he saw ghosts floating through the car. The conductor had to be summoned into the car to pick up the worn-out jaw before quiet was restored. The jaw is now in the office at Long Branch, where the owner can claim it. It is supposed to have been left by some medical student, who probably procured it in New York.

Her Husband Was on the Train.

"Yes," said a veteran conductor, "a great many women do flirt on the cars. I suppose that time hangs heavily on their hands during a long journey, and they hardly know what to do with themselves. Under the circumstances it is quite natural for them to fall into conversation with their fellow travelers of the opposite sex, and, having made a beginning, it is very easy for them to become silly. Let me tell you about the worst case of flirting I ever saw. It was about two years ago, down in Ohio. On my train was a young woman dressed in deep mourning, and at the beginning of her journey having a heavy black veil over her face. She was apparently of a lively disposition—a cheerful soul, always disposed to look on the bright side of life and to make the best even of unfavorable circumstances—and it was not long before she removed the veil. Soon afterward she began looking around at her fellow passengers, and in an hour or two I saw her in animated conversation with a handsome young drummer from Chicago. They talked and laughed and exchanged cards, and really grew quite fond of each other, and, for all I know, made arrangements to carry on a correspondence. This was bad enough in itself, but what made it all the worse was the fact that the woman's husband was on the same train, ahead in the baggage car."

"The baggage agent?"

"No, he was in a long pine box in charge of the baggage-master."—*Chicago Herald.*

The Verdict on the Rio Accident.

The Coroner's jury at Rio, Wis., on the victims of the recent accident on the Chicago, Milwaukee & St. Paul road, concluded their labors on Nov. 9. Their verdict is as follows:

"An inquisition taken at the town of Otsego, in the county of Columbia and state of Wisconsin, beginning on the 28th day of October, 1886, and concluding on the 9th day of November, 1886, before B. M. Allen, Coroner of said county upon the view of the bodies of Sarah C. Winters, Frank Gangon, Orisme Dubue, Emil Woltersdorf, Louis Brinker, two nuns, names unknown to us, and other persons, the number of whom and their names are unknown, there dead, by the jurors whose names are hereunto subscribed, who, being duly sworn to inquire on behalf of this state into what manner and by what means the said persons came to their deaths, upon their oaths do say that said persons came to their deaths by reason of the limited train of the Chicago, Milwaukee & St. Paul Railroad going west, at the west switch of the south side track at East Rio, in said town of Otsego, at about 12:30 a. m., the said switch being open and causing the engine, mail, baggage, day coach and part of one sleeper to leave the track. We find that the above-named and unknown persons came to their deaths by being crushed and burned to death in the day coach of said train and we find that the said switch was left open by the negligence of C. H. Wells, an employé of the Chicago, Milwaukee & St. Paul Railroad Co.

The finding is signed by John Buchanan, foreman, John Urquhart, Milo Phelps, Edwin Fisk, C. M. Morris, David Robertson, jurors, and S. M. Allen, Coroner.

Wells was arrested at the instance of the Coroner and was taken before a Justice of the Peace, charged with criminal negligence. He was bound over to appear before the Circuit Court.

TECHNICAL.

Locomotive Building.

The shops of the Pennsylvania Co., in Fort Wayne, Ind., are building several new locomotives.

The Rhode Island Locomotive Works, in Providence, are very busy. The orders on hand include 3 ten-wheel freight engines for the Western & Atlantic; 4 freight engines for the Vicksburg & Meridian; 24 locomotives for the Louisville, Evansville & St. Louis; 4 consolidation freight engines and 2 shifting engines for the Louisville, New Albany & Chicago: 15 ten-wheel freight engines, with 19 by 26 in. cylinders, for the Chicago, Milwaukee & St. Paul; and a Forney engine, with 17 by 20 in. cylinders, for suburban passenger service on the Boston & Providence road.

The Portland Co., at Portland, Me., is running its shops full time, and has a number of orders for locomotives.

The Cooke Locomotive Works, in Paterson, N. J., have recently increased their working force, and the shops are now full of work.

The Car Shops.

The shops of the Philadelphia & Reading Co., at Reading, Pa., are building a number of new box cars 34 ft. long for the road.

The Knoxville Car Wheel Co. at Knoxville, Tenn., is building an addition to its works, which will nearly double their capacity.

The Terre Haute Car Co. at Terre Haute, Ind., is building a number of refrigerator cars of the Lorillard pattern for the Mobile & Ohio road. These cars are to be run between St. Louis & Mobile.

The Laconia Car Co. at Laconia, N. H., is to build a number of freight cars provided with the Eastman heater for a western road.

Bridge Notes.

The Birmingham Bridge Co. has been organized at Birmingham, Ala., with $250,000 capital stock, to make bridges and bridge iron. Messrs. J. C. Moore, of Birmingham, W. H. Sellers, of Dayton, O., and others are the incorporators.

The Massillon Bridge Co. at Massillon, O., has taken a contract to build a new bridge over the Hocking River at Guysville, O., for the Cincinnati, Washington & Baltimore road.

Manufacturing and Business.

The Industrial Works at Bay City, Mich., have just delivered to the Chicago & Northwestern, three 15-ton steam cranes for wrecking and construction work. They have now in course of construction in their shops, a 20-ton steam crane for the Union Pacific and a steam shovel for the same road, and one of their extension steam pile-drivers and a steam shovel for the Michigan Central Railroad.

Westinghouse, Church, Kerr & Co. are now fairly established in their enlarged quarters at 17 Cortlandt street, New York. The origin of their present business was a local agency for the Westinghouse engine in 1882, in the hands of Mr. Church of the present firm, occupying desk room only in the offices of another concern. From this small beginning the business has steadily increased until the present offices monopolize the entire ground floor of No. 17, with dynamo and testing room in the basement, and a private draughting room on the second floor. The concern gives employment to about 40 engineers, salesmen, outside superintendents and office employés, and through its sub-contractors to a total of more than 100 men.

The National Paint Works at Williamsport, Pa., report a good business with an increase in orders, especially for bridge work. They are now furnishing the paint for the iron work of 6 miles of the Elevated roads in New York. They have recently received orders for paint for about 8,000 new freight cars building at different shops.

Iron and Steel.

The Ohio Falls Iron Works in New Albany, Ind., are now running full double turn, the repairs to the rolling mill having been completed.

The National Tube Works at McKeesport, Pa., are running double turn in all departments. Preparations are being made to erect a furnace for making 24-in. pipe.

The Thomas Iron Co. will put its Keystone furnace at Chain Dam, Pa., in blast as soon as the repairs are completed.

The two Lucy furnaces in Pittsburgh turned out 14,281 tons of pig iron in October; No. 1 making 7,103 and No. 2 7,178 tons.

The Christiana Rolling Mill in Wilmington, Del., has been leased to Pennsylvania parties, who will run it hereafter.

The Coalburg Coal & Coke Co. has increased its capital stock $200,000, and will build a blast furnace of 100 tons daily capacity at Village Creek, near Birmingham, Ala.

The Dowling Furnace Co. has been organized in Chattanooga, Tenn., to build a blast furnace with 100 tons daily capacity.

The Rail Market.

Steel Rails.—Quotations continue steady at about $35 per ton at eastern mills, and it is said that orders for next year already placed foot up to 675,000 tons. The *Iron Age* says: "Mr. Jay Gould has bought 40,000 tons of American rails from two Pennsylvania mills, and has taken 20,000 tons of Cammell (English) rails at a little over $38 at New Orleans. In addition to this we note 25,000 tons for a former narrow-gauge road now widening to standard gauge, also taken by a Pennsylvania mill. The Manitoba has bought 20,000 tons from an eastern mill. There were sales furthermore of 10,000 tons to a new enterprise in the Northwest, given to a western mill, in addition to a similar lot reported before as taken by an eastern mill. The Union Pacific has placed about 13,000 tons with two western works, and a 5,000-ton lot for the Northwest was awarded to another mill. We note also sales to three New England roads of 11,000 tons in the aggregate, with others pending; 5,000 tons have been also

sold to Georgia. The Pennsylvania Railroad has, as usual, distributed its order among the three mills on its line. The amount is reported variously as having been between 33,000 and 48,000 tons in the aggregate."

Rail Fastenings.—Quotations are unchanged at 2.40 cents per lb. for spikes in Pittsburgh; 2.75@3 cents for track-bolts and 1.65@1.80 for splice-bars. There is an active demand and prices are firm.

Old Rails.—There is more demand for old iron rails, with a light supply, and quotations are $22@$23 per ton at tide-water. Old steel rails are scarce, and are quoted at $22.50 @$25 per ton in Pittsburgh.

Car Doors.

The Pennsylvania Co. is now building at various car shops 1,000 box cars, and is now in the market for 1,000 more, all of which are to be equipped with the Wagner car door. All cars built by the Pennsylvania lines, whether at their own shops or by contract, are equipped with the Wagner door.

The Vandalia line now equips all of its cars, when generally repaired, with the Wagner car door, as well as applying it to all new cars when built.

Petroleum as Fuel.

The San Francisco *Bulletin* of Nov. 10 says: "The ferry-boats 'Solano,' 'Piedmont' and 'Julia' again burn coal, the petroleum experiment having been abandoned. The Pacific Rolling Mill Co. has also returned to the use of coal. The petroleum plan worked well, but after a short trial was found to be so expensive that it had to be abandoned."

New Process for Multiplying Copies of Drawings.

A new process has recently been introduced, which appears to offer certain decided advantages over blue-printing, for a large class of drawings at least, and which is likewise useful, and in fact chiefly used, as a substitute for the hectograph or electric pen, for multiplying circulars and letters. It may be best described in two words as simplified lithography. In place of a heavy stone a sheet of prepared oiled paper is used, which is re-inked by a hand roller for each impression for as many copies as desired, but can only be used once. The paper, however, is cheap, and a new "lithograph" paper can be prepared from any one of the old copies at any time by sprinkling a powder over it.

The original drawing or writing is made on any kind of paper with a special ink, much like ordinary ink, which can be used in drawing pens. On smoothing it down over the parchment sheet a matrix impression is made, which can be inked any reasonable number of times, and as many impressions taken in plain black and white. The process is clean and rapid, and the apparatus not expensive. It is made to take sheets from note to double-elephant size, 26 × 40 in. It is being introduced by the Autocopyist Co., No. 3 Thomas street, New York.

Cars Heated by Steam from the Locomotive.

In a letter to the *American Engineer*, Mr. James Emerson says that, some 50 years ago, George Stephenson tried to heat the coaches of his trains by the steam from the locomotive, but failed. Five years ago the superintendent of the Connecticut River Railroad employed him (Emerson) to try the plan, in order to do away with the terrible accidents so common through the use of fire in cars. Commencing with one train, the method produced so much comfort and satisfaction that, at the close of last winter, twenty trains each way per day were heated in that way, and the five years of experience have proved the perfect practicability of the system.

A complete train on the Boston & Albany Railroad is likewise heated by steam from the locomotive by the Martin system, and we understand with excellent results.

Boston Suburban Street Railroads.

The manner in which the Lynn & Boston and the Boston Consolidated horse railroads are tapping each other's lines at various suburban points gives rise to rumors of their prospective consolidation at no distant day. To the Lynn & Boston Co. belongs the credit of demonstrating possibilities of profit in suburban horse railroad service which were not thought of previously. Operating over 40 miles of road, mainly in the suburbs, the Lynn & Boston is constantly adding new mileage. Its lines run from Boston to Chelsea, Swampscott, Peabody and Revere Beach, and it has lately laid tracks through the town of Saugus, and having bought the Stoneham street railroad, will build a connecting link from Saugus through Melrose to a junction with the Stoneham line. It is also extending its system into Woburn, and will probably build another branch from Melrose to Malden, where it will tap the Boston Consolidated.

The latter company proposes shortly to extend another of its present lines in Everett to Malden, and may also build through Maplewood until it meets the Lynn & Boston again between the latter village and Saugus. The two companies come together also in Everett Square and again at Woodlawn Cemetery, and they employ the same tracks for their entrance into Boston.

Interwoven, therefore, as these two systems are, their consolidation in the future is not improbable. It used to be argued that a horse-car service in the suburban towns could not be made profitable. A car between Charlestown and Roxbury, for instance, will receive four or five different sets of passengers in the progress of a single trip; but a car from Chelsea to Boston is occupied mainly by through passengers, and the car is filled but once for the entire trip. But the Lynn & Boston Co., with its policy of extending its system through the smaller suburbs, yet pays 8 per cent. dividends. The subject is of general interest as suggesting some of the future possibilities of horse railroad service in the suburbs.—*Boston Advertiser.*

Practical Engineering Conferences.

Recently Messrs. Westinghouse, Church, Kerr & Co. held, at their New York office, a general convention of their own salesmen and outside superintendents, together with experts not connected with the concern, to discuss and settle upon standards to be adopted by them in their average boiler practice. Among the invited guests were Mr. R. K. McMurray, Chief Inspector of the Hartford Boiler Insurance Co.; Geo. E. Barrus, Boston; Geo. F. Barnum, of the Bigelow Co., New Haven; and M. R. Muckle, Jr., of Philadelphia.

A lengthy and interesting discussion brought out the practical points of boiler construction, proportion, setting and operation, and enabled the firm to bring down its instructions to its engineers and salesmen to a uniform basis. The appropriate hospitalities of the occasion were in the meantime not forgotten. The firm have in view a monthly series of conferences on engineering subjects, the bearing of which will be of a commercially practical nature. This plan will result in great good to the concern and its clients.

A Cable Railroad in New York.

The directors of the Third Avenue Railroad Co. in New York are considering the question of a change from horse-power to a cable road. The Third avenue line was formerly one of the most profitable in the city, but its managers confess a large reduction in receipts, due partly to elevated railroad competition and partly to the strike, during which the company incurred the illwill of a large class of people, who have quietly avoided the road and taken other lines. The managers say that a reduction in expenses is necessary, and they expect to secure it by the use of the cable.

Fay's Tie-Cutting Machine.

Messrs. J. A. Fay & Co., of Cincinnati, are building a new machine for preparing railroad ties. It is remarkably complete, and performs all the operations necessary for turning out a finished tie, being the first machine of its kind. It is built to the order of the Tie-Preserving Works at Laramie, Wyoming Ter., for the Union Pacific Railway. The machine cuts both ends of the tie, and so ensures a uniform length and fair and square ends. It also makes grooves, and has two sets of spotting saws. When the tie is spotted, etc., it is automatically passed on to the boring heads, where four holes for the spikes are bored automatically. The tie is then removed to the preserving works.

Tests of a Locomotive with the Wootten Fire-box.

The *Hartford Courant* contains some interesting particulars as to the trial of a Wootten passenger engine on the New York, New Haven & Hartford road. The Wootten engine was one of the largest class, having 21 in. by 22 in. cylinders, and 68 in. drivers. The tractive force was thus 142.7 lbs. per lb. average pressure in the cylinders. The engine has about 70,000 lbs. on the drivers and the weight of engine and tender completely equipped for the road is stated to be 206,000 lbs. This engine ran the fast express trains, Nos. 5 and 50, for one week, her performance, consumption of fuel and water being carefully noted. A new engine designed by Mr. Henney, the Superintendent of Motive Power of the road then ran the same trains for a week and her performance was similarly carefully noted. Mr. Henney's engine has considerably smaller cylinders, 18 in. by 22 in. and 66 in. wheels. The tractive power would consequently be only 108 lbs. per lb. average pressure in cylinders or slightly under 76 per cent. of the tractive power of the Wootten engine. As will be seen from the following table, the average boiler pressure during the trials was also lower in the Henney than in the Wootten engine, and therefore still further reduced the relative cylinder power of the Henney engine. The following table give the results of one week's running for each engine:

	Henney.	Wootten.
Engine mileage, miles	1,212	1,212
Car " "	8,123	7,455
Average number of cars in train, number	6.70	6.15
Gross consumption of coal, lbs.	50,680	61,090
" " water, gallons	50,400	59,250½
Coal consumed per engine mile, lbs.	41.81	50.40
" " " car mile, lbs.	6.24	8.19
Water evaporated per lb. coal, lbs.	8.29?	8.087
Average boiler steam preasure, lbs.	142 66	150
Water consumed per engine mile, lbs.	346.5	418.9
" " " car mile, lbs	51.7	68.1

The last line in the table is very instructive, as it shows that the Wootten engine used fully 32 per cent. more steam per car mile than the Henney engine. The consumption of steam is practically independent of the system of fire-box used, and this great discrepancy merely shows that the huge cylinders of the Wootten engine were far too large for the work to be done on a comparatively level line like the New York, New Haven & Hartford. The relative efficiency of the two fire-boxes is better shown in comparing the evaporation per lb. of coal, and here the difference is not great. One pound of good bituminous coal can be made to evaporate 9 lbs. of water, while it is difficult to evaporate more than 8 or 8½ lbs. of water with small anthracite.

The fastest trains on the road run from New York to Springfield, 136 miles, in 3 hours 27 minutes, making three intermediate stops. This gives an average speed of 39.4 miles per hour, including stops and an average distance of 31½ miles between stopping stations. There are, however, several draw-bridges on the road, and the time lost in slackening and getting up speed again is of course considerable, and should be taken into account in judging of the performance.

Final Decision of a Safety Valve Patent Case.

A decision was rendered Nov. 15 by the United States Supreme Court in the patent case of the Consolidated Safety Valve Co., appellant, against Erastus B. Kunkle, appeal from the United States Circuit Court for the Northern District of Illinois. This was a suit in equity brought by the Consolidated Co. to recover damages for an alleged infringement of its patents upon an improved safety valve. The Court holds that the defendant's valves do not infringe the Consolidated Safety Valve Co.'s patents. The decree of the Circuit Court is therefore affirmed.

Growth of Passenger Travel on a Boston Road.

The report of the Boston & Providence Co. for the year ending Sept. 30 last says: "It is hardly necessary to remind stockholders of the large reductions which have taken place in fares since 1876, the increased mileage (with its attending expense) and the greater number of passengers to be carried to earn the same money in 1886.

"The accompanying comparisons may be of interest in regard to passenger business. The capital was the same in 1876 as now, and the miles of road owned and operated remain the same:

	1885-86.	1875-76.	Inc. or Dec.	P. c.
No of locomotives	58	42	I 16	38 1
No. of passenger cars	158	92	I. 66	71.7
Miles run (passenger)	745,626	533,037	I. 212,589	39.9
Passengers carried	6,119,906	3,475,378	I 2,144,528	76 1
Passenger-miles	57,990,699	37,948 007	I 20,042,692	52.8
Gross pass. earn	$1,084 013	$871,215	I. $212,798	24.4
Earnings per passenger mile	1.87 cts.	2.30 cts.	D. 0.43 ct.	18.7

"In ten years the increase in the number of passengers has been 76 per cent., while the increase of gross receipts has been but 24½ per cent."

Ondoyant Glass.

The Mississippi Glass Co., of St. Louis, is extending its already large works, and has taken up a new manufacture in ornamental glass, and is making very large quantities of a peculiar colored glass which is rapidly coming into use for clerestory lights in cars and other similar purposes, and is much admired. The ondoyant glass much resembles cathedral glass, but is made by a widely different process.

The clerestory lights used in the new cars for the Manhattan Elevated were made by the Mississippi Glass Co. from designs by Mr. Louis Tiffany, of New York. The handsome appearance of these cars, built by the Gilbert Car Works, at Troy, N. Y., has been much admired, and the clever blending of colors in the ondoyant glass gets the greatest share of admiration.

A Monster Gun-Car.

The heaviest gun at present in existence has just been shipped at Antwerp for Italy. It was manufactured by Krupp, is 46 ft. long, weighs nearly 260,000 lbs. without the breech-piece, and 264,684 lbs. with the breech. It arrived at Antwerp on a specially constructed carriage, 105 ft. long, and running on 32 wheels. It was at first intended to send the gun overland, but the St. Gothard Railroad and other Swiss railroads objecting on account of its great weight, and fearing for their bridges, the weapon had to be taken to Antwerp, and thence forwarded to Italy by sea. Its ultimate destination is stated to be Spezia, where it is to be mounted in one of the ironclad ports guarding that harbor.

This is probably the heaviest load ever taken by one railroad car, but the advance in the last 50 years has not been so very great. A block of granite weighing 134,400 lbs. was conveyed over the old Quincy Granite Railroad in Massachusetts, in 1833, in a car with 16 wheels. The Pennsylvania Railroad gun-car has 16 wheels and measures 31 ft. 10 in. long by 9 ft. wide.

Western Society of Engineers.

The 230th meeting was held in Chicago, Nov. 2, Presiden Wright in the chair.

Applications to be admitted to membership were received from Messrs. C. F. Carl Binder, Bernhard Feird and John Wilson. Mr. Arthur H. Bell, City Engineer of Bloomington, Ill., was elected a member.

The Secretary read a paper on Street Pavements of Brick, by Mr. A. H. Bell.

A circular letter from the American Society of Civil Engineers was read, asking communications from this and other engineering societies on the subject of changes in the organization of the American Society. It was understood that the changes had reference to an organic union of the other societies with the American Society, and it was voted that consideration of this matter should be made the special business of the next meeting. The Society then adjourned.

Members are requested to attend the next meeting, Tuesday, Dec. 7, prepared to discuss the circular of the American Society.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Boston & Albany, annual meeting, at the Meionaon in Boston, at 11 a. m. on Dec. 8.

Buffalo, Rochester & Pittsburgh, annual meeting, at the office in New York, Nov. 24.

Cincinnati, Hamilton & Dayton, special meeting, at the office in Cincinnati at 10 a.m. on Nov. 30.

Florida Railway & Navigation Co., special meeting, at the office in Fernandina, Fla., at noon on Dec. 3.

Mobile & Ohio, annual meeting of debenture holders, at the office of the company, No. 11 Pine street, New York, Nov. 20, at noon.

New York & New England, annual meeting, at the office in Boston, Dec. 14. Transfer books close Nov. 27.

Old Colony, annual meeting, at the United States Hotel in Boston, at 10:30 a. m. on Nov. 23.

Peoria, Decatur & Evansville, special meeting, in Peoria, Ill., Dec. 20.

Richmond & Danville, annual meeting, at the office in Richmond, Va., Dec. 8, at noon. Transfer books close Nov. 8.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Delaware & Bound Brook (leased to Philadelphia & Reading), 2 per cent., quarterly, payable Nov. 16.

Iowa Falls & Sioux City (leased to Illinois Central), 1¼ per cent, payable Dec. 1. This company dropped from 1¾ to 1½ per cent. in September, and now drops again to 1¼ per cent.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Association of Railroad Trackmen of North America* will meet at Council Bluffs, Ia., on Thursday, Nov. 25.

The *Master Car-Builders' Club* holds its regular meetings at the rooms, No. 113 Liberty street, New York, on the third Thursday in each month.

The *New England Railroad Club* holds its regular meetings at its rooms in the Boston & Albany passenger station in Boston, on the second Wednesday of each month.

The *Western Railway Club* holds its regular meetings at its rooms in Chicago on the third Wednesday in each mouth.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

Foreclosure Sales.

The *Indianapolis, Peru & Chicago* road was sold in Indianapolis, Nov. 13, under a decree of foreclosure granted by the United States Circuit Court, and was bought for $850,000 by Mr. N. H. Swayne, Attorney for the Bondholders' Committee (Messrs. R. G. Rolston, John T. Terry and Edmund E. Randolph). The road was sold subject to a prior mortgage for $275,000. It extends from Indianapolis to Peru, Ind., 74 miles, and has been for some years part of the Wabash system. The mortgage under which it was sold was executed by the Wabash and was for $3,225,000, the bonds being issued in exchange for the stock of the former company.

The *Chicago, Cincinnati & Louisville* road was sold at the same time and under the same decree, and was bought for $501,000 by Mr. F. W. Whitridge, representing the Bondholders' Committee, (Messrs. Adrian Iselin, John Crosby Brown, D. B. St. John, F. W. Whitridge and W. W. Niles. The road extends from Peru, Ind., to Laporte, 73 miles; it was held by the Indianapolis, Peru & Chicago Co. under a perpetual lease, and was turned over to the Wabash with that road. It is now sold under the first mortgage for $1,000,000.

The *Michigan City & Indianapolis* road was sold at the same time and under the same decree, and was bought for $155,000 by Mr. N. H. Swayne for the Indianapolis, Peru & Chicago Bondholders' Committee. This road extends from Laporte, Ind., to Michigan City, 13 miles, and was operated by the Indianapolis, Peru & Chicago Co. until turned over to the Wabash with that company's line.

The *Council Bluffs & St. Louis* road will be sold in Council Bluffs, Ia., Dec. 28, under a decree of foreclosure granted by the United States Circuit Court. The sale will include the road from Council Bluffs, Ia., to the Missouri state line, 137 miles, with all the equipment and other property. The purchaser will be required to pay $50,000 in cash at the time of sale, and on the confirmation of the sale such further amount in cash as the Court may require, the balance to be payable either in cash or in first mortgage bonds and overdue coupons. The road was formerly a part of the Wabash system, but for some time past has been operated by a separate receiver.

The *Clarinda & St. Louis* road will be sold in Council Bluffs, Ia., Dec. 28, under a decree of foreclosure granted by the United States Circuit Court. The sale will include the line from Roseberry to Clarinda, Ia., 23 miles. The purchaser will be required to pay $2,000 in cash at the time of sale and the balance in cash or bonds at such time as the Court may direct. The road is a branch of the Council Bluffs & St. Louis, and was formerly a part of the Wabash system.

Wabash Surgeons' Convention.

The surgeons of the Wabash system met in Kansas City, Mo., Nov. 9, about 60 being present, with President J. W. Jackson in the chair. Dr. M. O. Lowar, of North Manches-

ter, Ind., read a paper on "The Treatment of Wounds," and Dr. C. B. Stemen, of Fort Wayne, Ind., a paper on "Antiseptic Surgery." The papers were discussed by Dr. Jackson, of Kansas City; Dr. Bird, of Quincy, Ill.; Dr. French, of Mexico, Mo.; Dr. Schafer, of Huntington, Ind., and others. At the afternoon session Dr. G. S. Gregg, of Fort Wayne, Ind., in a paper entitled "Report of an Interesting Case," described how he had saved a badly crushed arm after amputating one of his patient's legs. "A Case of Sciatica—Was it the Result of Trauma?" was the subject of the paper read by Dr. S. A. Spillman, of Ottumwa, Ia.

The convention adjourned the same evening.

New England Railroad Club.

This club will hold meetings Wednesday, Dec. 8, at its rooms, Boston & Albany Station, Boston, in the afternoon at 2 o'clock, and in the evening at 7:30.

Subjects for discussion: In the afternoon at 2 o'clock, Interchange of Cars (continued from last meeting).

In the evening at 7:30, Standard Size of Wheel Centres for Steel-Tired Car and Engine Truck Wheels.

The question of the importance of the use of steel-tired wheels in passenger service is being more and more favorably considered, making the question of standards at this time one of great economic proportions.

Should there be one standard size of wheel, and if so, what should that size be?

Those unable to be present are requested to communicate their views in writing.

It is hoped that all interested in car and engine truck wheels will make a special effort to be present at the evening session.

ELECTIONS AND APPOINTMENTS.

Astoria & Tillamook.—The directors of this new company are: J. O. Hanthorn, J. C. Trullinger, G. Wingate, Astoria, Or.; J. W. M. Harvey, George E. Withington, Portland, Oregon.

Baltimore & Ohio.—At the annual meeting in Baltimore, Nov. 15, the following directors were chosen: Wm. F. Burns, James Carey Coale, John K. Cowen, George W. Dobbin, F. Harrison Garrett, John Gregg, Joshua G. Harvey, Decatur H. Miller, John Speare Nicholas, Aubrey Pearre, Wm. W. Taylor, G. A. Von Singen. The only new director is Mr. Cowen, who succeeds Henry Clay Smith, deceased.

Boston & Providence.—At the annual meeting in Boston, Nov. 17, the following directors were chosen: Henry A. Whitney, Thomas P. I. Goddard, William R. Robeson, Joseph W. Balch, R. C. Taft, Robert H. Stevenson, and Roger Wolcott. The following officers were subsequently elected: Henry A. Whitney, President; Winslow Warren, Clerk; B. B. Torry, Treasurer; A. A. Folsom, Superintendent.

Carolina, Cumberland Cap & Chicago.—The following directors were elected at a meeting in Abbeville, S. C., Nov. 3: R. E. Bowen, R. W. Haddon, A. H. Gregg, William McFarland, Lewis Jones, J. S. Cothran, W. W. Sawyer, H. J. Epting, Dr. T. G. Croft, J. H. Duckworth, T. C. Cain.

Central Iowa.—Mr. A. B. Clough has been appointed Assistant General Freight Agent.

Central, of New Jersey.—Mr. S. M. Williams has been appointed Comptroller and Secretary to the Receivers, and Mr. J. W. Watson Treasurer for the Receivers.

Chicago, Kansas & Western in Illinois.—The directors of this company are: Henry Botsford, Charles L. Hutchinson, Elson Keith, Sidney A. Kent, Wm. J. Watson, Norman Williams, Chicago; Isaac T. Burr, Benjamin P. Cheney, Albert W. Nickerson, Alden Speare, Wm. B. Strong, Boston.

Cleveland, Akron & Columbus.—Mr. H. B. Dunham is Acting General Freight Agent and Mr. Charles O. Wood Acting General Passenger Agent, Mr. E. C. Jones, General Freight and Passenger Agent, having received leave of absence for six months on account of ill health.

Denver, Memphis & Atlantic.—The officers of this company are: J. J. Burns, President, Wichita, Kan.; Chas. C. Black, Vice-President and Secretary, Wichita, Kan.; Thos. Donahue, Treasurer, Belle Plain, Kan.; D. J. Thayer, Chief Engineer and General Manager, Wichita, Kan.; J. D. Dunn, Trainmaster, Chetopa Division, Chetopa, Kan.; Samuel Hunt, Trainmaster, Conway Springs Division, Conway Springs, Kansas.

Duluth & Wisconsin.—The incorporators are: E. E. Barton, W. V. Noad, West Superior, Wis.; Albert S. Chase, Duluth, Minn.; W. H. Fisher, J. H. Hammond, St. Paul, Minnesota.

Elmira, Cortland & Northern.—Mr. M. A. Smith has been appointed Auditor in place of Mr. Edward H. Mahler, who has gone to the Philadelphia & Reading road.

Evansville, Seymour & Bellefontaine.—This company has recently elected the following directors: I. N. McBeth, John T. Shields, S. H. Huffman, C. B. Cold, A. W. Carpenter, G. B. Eastin, H. C. Kumble, G. R. Hawes, J. H. Foos. The office is at Seymour, Indiana.

Florida Midland.—The officers of this company are: President, Edward Page, Boston; Secretary and Treasurer, C. W. Morris, Boston; Directors, John F. Cogswell, Andover, Mass.; Moses W. Dorr, Elisha Whitney, John Spaulding, Cyrus Carpenter, C. C. Read, Boston.

Franklin & Megantic.—At the annual meeting, Nov. 10, the following directors were chosen: John Winder, Kingfield, Me.; W. S. Heath, Salem, Me.; J. W. Porter, Philip Stubbs, Strong, Me.; N. B. Bryant, S. W. Sargent, V. B. Wood, Boston. The board elected S. W. Sargent, President; Philip Stubbs, General Manager and Treasurer; Charles P. Bryant, Assistant Superintendent; W. F. Fogg, Cashier.

International, of Maine.—At the annual meeting, Nov. 11, the following directors were chosen: C. R. Burpee, Charles F. Woodward, Bangor, Me.; George Olds, Thomas D. Shaughnessy, Sir Donald A. Smith, Sir George Stephen, Wm. C. Van Horne, Montreal, Canada.

Louisville, Cincinnati & Dayton.—The officers of this company are: J. C. Fawcett, President; Charles F. Gunckel, Vice-President; W. V. McCracken, Secretary and Treasurer.

Macopin.—The officers of this new company are: President, Garrett A. Hobart; Secretary and Treasurer, John R. Bartlett. Office in Paterson, New Jersey.

Memphis & Charleston.—At the annual meeting in Huntsville, Ala., Nov. 11, the following directors were chosen: Napoleon Hill, J. C. Neely, Memphis, Tenn.; S. S. Chamberlin, Chattanooga, Tenn.; Addison White, Huntsville, Ala.; R. H. Richards, Atlanta, Ga.; C. M. McGhee, Knoxville, Tenn.; Calvin S. Brice, Lima, O.; John D. McComb, Dobbs Ferry, N. Y.; John T. Martin, Brooklyn, N. Y.; John G. Moore, Samuel Shethar, Samuel Thomas, New York. The new directors are Messrs. Chamberlin and Moore, who succeed C. M. McClung and Henry Fink.

Minneapolis, Lyndale & Minnetonka.—Mr. F. C. Pillsbury has been chosen President in place of Mr. S. S. Small, resigned, and Mr. C. H. Benedict, of St. Paul, has been chosen Vice-President to succeed Mr. Pillsbury.

Minnesota & Northwestern.—General Superintendent Raymond Du Puy issues the following, dated St. Paul, Minn., Nov. 1: "Mr. Joel May is this day appointed Superintendent of the St. Paul Division of this railroad, with office at St. Paul, Minn. The line from St. Paul, Minn., to Dubuque, Ia., with branch from Hayfield to Lyle, Minn., will be known as the St. Paul Division. From St. Paul to Elma will be called the First Section, and from Elma to Dubuque the Second Section." Mr. May has heretofore been Trainmaster of the road.

Monadnock.—At the annual meeting in Peterboro, N. H., Nov. 16, this company, whose road is leased to the Cheshire Railroad Co., elected H. K. French, President; O. H. Bradley, J. H. Fairbanks, W. G. Livingston, Peter Ripton, E. C. Mayer, Rodney Wallace, directors; J. H. Cutler, Clerk and Treasurer.

Naugatuck.—At the annual meeting in Bridgeport, Conn., Nov. 17, the old directors were re-elected. At a subsequent meeting of the directors the following officers were chosen: President, W. D. Bishop; Secretary and Treasurer, Horace Nichols, of Bridgeport; Superintendent, George W. Beach, of Waterbury; Auditor, Samuel Wilmot, of Bridgeport.

New Haven & Derby.—At the annual meeting in New Haven, Conn., Nov. 16, the old board of directors and the old officers were re-elected.

New York, Lake Erie & Western.—Mr. W. L. Derr has been appointed Roadmaster of the Delaware Division in place of Mr. George H. Paine, transferred to the Rochester Division.

Norfolk & Virginia Beach.—The United States Circuit Court has appointed C. M. Fry Receiver.

Ohio Valley.—At the annual meeting in Jackson, Tenn., Nov. 5, the following directors were chosen: W. P. Robertson, John L. Wisdom, Jackson, Tenn.; J. F. Clay, Jordan Giles, P. G. Kelsey, Henderson, Ky.; H. Brown, S. S. Brown, Pittsburg, Pa. The board re-elected P. G. Kelsey President and General Manager.

Mr. James Montgomery has been appointed General Superintendent, with office at Henderson, Kentucky.

Petersburg—At the annual meeting in Petersburg, Va., Nov. 16, the following were elected: President, B. F. Newcomer, Baltimore; directors, R. R. Bridgers, Wilmington, N. C.; D. W. Lassiter, F. R. Scott, Richmond, Va.; H. Walters, Wm. T. Walters, Baltimore. Mr. Newcomer succeeds Maj. E. T. D. Myers, who declined a re-election as President.

Port Royal & Western Carolina.—The directors of this consolidated company are: John Ferguson, W. L. Mauldin, Greenville, S. C.; J. J. Blue, J. A. Barksdale, Laurens, S. C.; T. J. Moore, Spartanburg, S. C.; W. A. Humphreys, Anderson, S. C.; D. C. Nelson, Beaufort, S. C.; J. H. Alexander, J. B. Cumming, C. H. Phinizy, E. R. Schneider, E. F. Verdery, Augusta, Ga.; W. G. Raoul, Savannah, Georgia.

Providence & Worcester.—Mr. Wm. A. Leete has been appointed Acting Treasurer in place of John R. Balch, deceased.

Raleigh & Augusta Air Line.—At the annual meeting in Raleigh, N. C., Nov. 11, Mr. John M. Robinson was re-elected President, with the old board of directors.

Raleigh & Gaston.—At the annual meeting in Raleigh, N. C., Nov. 11, Mr. John M. Robinson was re-elected President, with the old board of directors.

St. Joseph & Grand Island.—Mr. W. W. Carter has been appointed Bridge Superintendent, with headquarters at St. Joseph, Mo. He was recently on the Hannibal & St. Joseph road.

St. Louis & Hannibal.—General Manager E. C. Case issues the following circular: "Mr. Munson T. Case having resigned the position of General Agent at St. Louis to accept service with another company, Mr. John F. Weir is hereby appointed to fill the vacancy, with office at 214 North Fourth street, Hannibal, Missouri."

San Antonio & Aransas Pass.—The following order from U. Lott, President and General Manager, is dated San Antonio, Tex., Nov. 8: "Mr. B. F. Yoakum has this day been appointed Assistant General Manager, in full charge of the operated lines of this company. All parties interested will govern themselves accordingly. All matters pertaining to construction will, as heretofore, be referred to the undersigned."

Under date of Nov. 9 Mr. Yoakum issues the following: "Mr. J. A. Creaser has been appointed Trainmaster of this company. Heads of departments, in maintenance of way, foremen of bridges and shops, and all employés in train service, will report to him and be governed by his instructions accordingly."

Southern Central—At the annual meeting in Auburn, N. Y., Nov. 11, the following directors were chosen: Thomas C. Platt, E. P. Wilbur, J. N. Knapp, William Stevenson, H. L. Storke, John A. Thomas, E. D. Clapp, Jeremiah P. Cady, William I. Cornwell, John Taylor, D. A. Smith, James G. Knapp, E. R. Robinson. The board re-elected T. C. Platt, President; John N. Knapp, Vice-President; H. L. Storke, Treasurer; Dexter A. Smith, Secretary.

Toledo, Ann Arbor & North Michigan.—The following changes are officially announced: "Mr. J. B. Conners is appointed Master of Transportation, with headquarters in Toledo. He will have charge of the movements of trains, the disposition and ordering of cars, and direction over all conductors, baggage and brakemen. Mr. C. C. Dodge is appointed Master Mechanic. His headquarters will be at Manhattan Junction. He will have charge of all repairs, engines, cars and direction over all shop employés, engineers, firemen and car inspectors. Mr. H. Smith is appointed Supervisor of bridges, buildings and water stations. His headquarters will be at Azalia, and will have charge of all employés engaged upon work on these structures. Mr. George L. Davis is appointed Roadmaster. His headquarters will be at Toledo. He will have charge of all work on roadway and track, including fences, and direction over all employés engaged on such work."

Union Pacific.—Dr. G. W. Perkins has been appointed Division Surgeon for the Wyoming Division, with office at Ogden, Utah. Dr. D. T. Sturdevant has also been appointed Surgeon for the Kansas Division, to succeed Dr. John Weldon, resigned.

Valley (Ohio).—Mr. George C. Berry, Jr., is appointed Assistant Auditor and Paymaster, with office in Cleveland, O. Mr. F. E. Smith succeeds Mr. Berry as agent at Akron, Ohio.

Valley (Virginia).—At the annual meeting in Staunton, Va., Nov. 15, the following were elected: President, Samuel Spencer; Directors, Decatur H. Miller, Osmun Latrobe, Henry Duvall, R. W. Burke, W. A. Anderson, J. J. Allen.

Wabash, St. Louis & Pacific.—Mr. A. W. Quackenbush has been appointed Master Mechanic in charge of the shops at Moberly, Mo. Mr. Caleb Remmel will succeed Mr. Quackenbush as Master Mechanic of the Detroit Division.

Mr. Charles S. Crane has been appointed Assistant General Passenger and Ticket Agent, with headquarters at St. Louis.

Worcester Excursion Car Co.—The following circular from Pres. Jerome Marble is dated Worcester, Mass., Nov. 16: "On account of the resignation of General Superintendent W. H. Shuey, the office of this company at No. 116 Broadway, New York, will be discontinued from Dec. 1, until further notice. All communications relating to the operating department of this company should thereafter be addressed to this office. Mr. Shuey's resignation has been insisted upon by him, in order that he may engage in other business, and it has been accepted with reluctance."

PERSONAL.

—Mr. R. F. Wilson has resigned his position as General Passenger Agent of the New York, Rutland & Montreal.

—Mr. S. S. Small has resigned the Presidency of the Minneapolis, Lyndale & Minnetonka Co., on account of a pressure of private business.

—Mr. John J. Fowler, Eastern Passenger Agent of the Wabash, St. Louis & Pacific at Philadelphia, died in that city, Nov. 2, of consumption. He had been with the Wabash road 12 years.

—Mr. W. B. Shattuc, General Passenger Agent of the Ohio & Mississippi road, has declined the commissionership of the Southwestern Passenger Association, which was recently offered him.

—Mr. W. W. Carter has resigned his office as Bridge Superintendent of the Hannibal & St. Joseph to accept a similar position on the St. Joseph & Grand Island. He had been with the former road for 10 years.

—Mr. George Stephens, General Purchasing Agent of the Louisville, New Albany & Chicago Co., has resigned that position, to date from Dec. 1. Mr. Stephens, it is understood, has accepted a position on the Ohio & Mississippi.

—Mr. E. C. Jones, General Passenger and Freight Agent of the Cleveland, Akron & Columbus road, was compelled on account of ill health to go to Colorado for several months recently, and now goes to California to remain until next June.

—Gen. E. P. Alexander, well known as a railroad man from his former connection with the Georgia, the Louisville & Nashville and other Southern roads, is formally announced as a candidate for President of the Central Railroad Co. of Georgia, in opposition to the present management.

—As we go to press the death of Ex-President Chester Allan Arthur is announced. President Arthur is best known by his public life and his career as a lawyer, which will be sufficiently commented on in the daily papers. It has been understood that, if he should recover his health, he would take a prominent part in furthering the plans of the New York District Co. for an underground railroad in New York city.

— Mrs. Dorcas Chapin, widow of Chester W. Chapin, formerly President of the Boston & Albany railroad, and member of Congress, died in Springfield, Mass., Nov. 14, at the age of 85. She was born in Chicopee, was married in 1825 and came to Springfield in 1830. She leaves three children —Margaret, wife of President Bliss of the Boston & Albany Co.; Anna C., wife of Vice-President James A. Rumrill of the Boston & Albany, and Chester W. Chapin, Jr., of New York. Since her husband's death, in 1883, Mrs. Chapin has lived in retirement, ever stretching out her hand in benevolence. Of her gifts, the City Library has received $10,000; the Home for the Friendless, $3,000; the Old Ladies' Home, 3,000; the Cemetery Association, in the form of a memorial chapel, $20,000; the local Unitarian society, $11,000 for a parsonage, and Amherst College, in funds, paid to make good the depreciation of securities given by her husband, $23,000, and beyond these public benefactions there were many others which instinctive modesty prompted her to keep unknown.

TRAFFIC AND EARNINGS.

Chicago Shipments Eastward.

The Board of Trade reports east-bound shipments from Chicago for the week ending Oct. 30 as follows, in tons:

	Tons.	P.c.		Tons.	P.c.
Chi. & Gd. Trunk	2,939	7.9	Pitts., Ft. W. & C.	7,290	19 7
Mich. Central	4,534	12.2	Chi., St. L. & Pitts.	6,657	18.0
Lake Shore	5,441	14.7	Balt. & Ohio	2,629	7.1
N. Y., Chi. & St. L.	4,046	10.9	C. Ind., St. L. & C.	3,515	9 5

The statement includes local as well as through shipments. The total for the week was 37,051 tons, being a decrease from the previous week of 4,832 tons, or 11.5 per cent. The shipments were the lightest for six weeks. The falling off was probably due in part to the strike at the stock-yards.

Shipments for eight weeks past by these reports have been, in tons:

Week ending							
Sept. 25.	Oct. 2.	Oct. 9.	Oct. 16.	Oct. 22.	Oct. 30.	Nov. 6.	Nov. 13.
36,023	36,122	43,556	41,347	45,820	46,688	41,883	37,051

Shipments by the Chicago & Atlantic road are not included above; the through tonnage by that line for the week is given at 4,685 tons.

Indianapolis Car Movement.

The weekly dispatch from Indianapolis says: "The train records show that in the week ended Nov. 13 there were 474 more loaded cars received and forwarded than in the week ending Nov. 6, and 1,790 more than in the corresponding week of 1885. In east-bound there was an increased movement, but it was made in increased shipments of live stock. The grain tonnage carried was about the same as in the preceding week. Since the advance in lumber rates shipments of this class of freights have been light west-bound."

The total number of cars, loaded and empty, received and forwarded for the week was 21,671, against 20,506 for the preceding week, and 20,178 for the corresponding week last year.

Southern Kansas Pool.

The roads interested in the formation of the new Southern Kansas pool selected as arbitrators to decide on division and basing rates Messrs. George R. Blanchard, Commissioner of the Central Traffic Association; E. P. Vining, Commissioner of the Western Trunk Lines Association; J. Waldo, Commissioner of the Texas Traffic Association, and William Duncan, General Freight Agent of the Ohio & Mississippi. Subsequently Mr. Blanchard said that he would be unable to serve, and Mr. George M. Bogue, of Chicago, was chosen in his place.

Chicago-Ohio River Pool.

At a meeting held in Chicago, Nov. 17, the Executive Committee of the Chicago-Ohio River pool agreed to continue for one year, from Dec. 31, the five sub-pools forming the general association. The Louisville, New Albany & Chicago,

and the Pennsylvania, each received an increase of 2½ per cent. in the Chicago-Louisville freight pool. When the affairs of the sixth pool were taken up less progress was made. An attempt was made to change the percentages of the Evansville & Cairo lines, and the result was the appointment of a conference committee on the subject, with instructions to report to an adjourned meeting.

A New Lake Steamer Line.

The Baltimore & Ohio Co. has concluded negotiations with Detroit parties, represented by Mr. Thomas Adams and Mr. Jesse H. Farwell, to place next season a line of propellors to be run between Sandusky, O., and Duluth in connection with the Baltimore & Ohio road. It is said also that arrangements will be made for a line from Fairport, O., to Marquette, which will be chiefly used to carry ore to Fairport, from which point the Baltimore & Ohio now controls a line to Pittsburgh.

Southern Railway & Steamship Association.

The Rate Committee met in New York Nov. 11, and continued in session on Nov. 13. The work of the Committee was principally of a routine nature, readjusting local rates and classifications. A petition was presented from the merchants in New York and Macon, asking that cotton piece goods may be placed in a lower class than at present.

The Executive Committee also met in New York, Nov. 12, but transacted no business of special importance.

The Rate Committee of the Southern Railway & Steamship Association at its last meeting fixed rates on fertilizers; these rates are as follows to leading points, per ton of 2,000 lbs.:

	From			
To	Charleston and Savannah.	Wilmington.	Norfolk.	Richmond.
Augusta	$2.00	$2 25	$2.75	$2.75
Atlanta	3.42	3 55	3.85	3.85
Birmingham	3 25	3.45	3.85	3 85
Montgomery	3.00	3.70	3.85	3.85
Meridian	3.50	....	....	....
Decatur, Ala	4.00	4.20	4.50	4.50
Basing rates to points beyond:				
Chattanooga, Rome and Dalton	3.00	3.20	3.35	3.35
Decatur, Ala	3.50	3.70	4.00	4.00

These rates took effect Nov. 1 and are expected to continue through the season.

Coal.

Coal tonnages for the week ending Nov. 6 are reported as follows:

	1886.	1885.	Inc. or Dec.	P.c.
Anthracite	718,564	786.322	D. 67.758	8.6
Eastern Bituminous	291,955	258,333	I. 33,622	13.0
Coke	85,784	55,129	I. 30,655	55.7

The demand for anthracite continues active. There has been some talk of another increase in prices, but such action does not seem probable at present.

A meeting of bituminous coal shippers was held in Baltimore last week, at which committees were appointed to present some plan for regulating the trade.

The coal tonnage of the Baltimore & Ohio Railroad for the year ending Sept. 30 was:

	1885-86.	1884-85.	Increase.	P c
Main Stem, Co.'s use	489.361	443.544	45 817	10.3
" " commercial	3.184,088	3,043,626	140.461	4.6
Total Main Stem	3,673,448	3,487 170	186,278	5.3
Pittsburgh Division	2,427, 38	2,003 982	423,256	21.1
Trans-Ohio lines	1,329,681	909,594	420,087	46.2
Total	7,430,367	6,400,746	1,029,621	16.1

Of the Main Stem commercial tonnage last year 2,237,448 tons were carried to Baltimore and 946,639 tons delivered at local or western points. The large increases on the Pittsburgh Division and the Trans-Ohio lines are notable. Coke is included in coal.

St. Louis coal receipts for the ten months to Oct. 31 were, in tons:

	1886.	1885.	Inc or Dec.	P.c.
Coal	1,567.254	1,637,955	D. 70,701	4.3
Coke	83,578	41,718	I. 41,860	10.0
Total	1,650,832	1,679,673	D. 28,841	1.7

The greater part of the coal comes from Southern Illinois by rail.

San Francisco coal receipts in October were 155,521 tons. The total receipts for the ten months to Oct. 31 were 791,721 tons, of which 14,581 tons were Eastern (anthracite and Cumberland); 156,997 tons English; 191,217 tons Australian, and the balance Pacific Coast coals. The receipts were all by water.

Pennsylvania Railroad coal tonnage for the week ending Nov. 13 was:

	Coal.	Coke.	Total.	1885.
Line of road	162,893	82,416	245,309	218 459
From other lines	77,144	575	77,719	110,133
Total	240,037	82,991	323,028	328,592
Year to Nov. 13	10,024.911	3,029,245	13,054,156	12,073,612

Decrease for the week, 5,564 tons, or 1.7 per cent.; increase for the year, 980,544 tons, or 8.1 per cent.

Cumberland coal shipments for the week ending Nov. 13 were 57,735 tons. Total to Nov. 13 this year, 2,166,353; last year, 2,422,223; decrease, 255,870 tons, or 10.6 per cent.

Cotton.

Cotton movement for the week ending Nov. 12 is reported as follows, in bales:

	1886.	1885.	Inc. or Dec.	P.c.
Interior markets:				
Receipts	194.857	173,210	I. 21,647	12.5
Shipments	156 844	149,923	I. 6,921	4.6
Stock, Nov. 21	317,697	279,931	I. 37,766	13.5
Seaports:				
Receipts	273 550	232.061	I. 41,489	17.9
Exports	144 0 6	144,415	D. 389	0.3
Stock, Nov. 12	757,438	760,910	D. 3,472	0.4

The total movement from plantations for the crop year to Nov. 12 is estimated at 2,346,739 bales, against 2,372,173 last year, 2,292,014 in 1884, and 2,456,221 in 1883.

East-bound Freight Rates.

At its meeting in Chicago, Nov. 17, the Central Traffic Association adopted a recommendation to the trunk lines that east-bound freight rates be advanced for Dec. 1 to the basis of 30 cents on grain Chicago to New York. There was some opposition to this resolution.

East-Bound Passenger Rates.

A Chicago dispatch of Nov. 16 says: "The meeting of the Passenger Department of the Central Traffic Association, held at Assistant Commissioner Daniels' office to-day, was fully attended, nearly every important line in the association being represented by its general passenger agent. There seemed to be a desire on the part of the representatives of the various roads to bring about such action as would insure the maintenance of east-bound passengor rates hereafter. After some discussion it was decided that, commencing this morning, all east-bound passenger rates from Chicago shall be restored to tariff, and that the resolution restoring the rates carry with it the redemption agreement adopted at the Cincinnati meeting, Nov. 3. The Chicago & Atlantic voted for this resolution, and consequently will act with the other roads in the association hereafter and abide by the agreement. Mr. France Chandler, General Passenger Agent of the Wabash, was elected Arbitrator to arbitrate the question of east-bound passenger rates from Louisville. It was also agreed that the roads in the association should hereafter require their full proportions of tariff rates from western connections, so as to prevent the cutting of through rates by connecting lines."

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1886.	1885	Inc. or Dec.	P. c
Ten months to Oct. 31:				
Bur., C. R. & No.	$2,335,860	$2,513,599	D. $177,739	7 1
California South.	556,269	.....	.....	....
Cape F. & Y. Vy.	184,486	171,334	I. 13,152	7 7
Central Iowa	1,065 671	1,055,935	I. 9,736	0 9
Cin., J. & Mack.	149 423	106.183	I. 43.240	40.8
Cin., N. O. & T. P.	2,319,733	2,167,161	I. 152,572	7.0
Cleve., Ak. & Col.	443,891	419,922	I. 23,969	5.6
Cleve. & Canton	296 253	242,316	I. 53,947	22.2
Net earnings	83,562	47,065	I. 36,497	77.6
Col. & Cin. Mid.	262,35	164,191	I. 98.161	59 7
Den. & R. G. W.	851 663	842,379	I. 9,284	1.1
Ft. Worth & D.	340.394	386,752	D. 46,358	12 0
Gulf, Col. & S. F.	1,760,708	1,405,633	I. 355,075	25 3
Hous. & Tex. C.	2,311,074	1,985,266	I. 325,808	16.4
Illinois Central:				
Ill. lines	5,459 611	5,350,472	I. 109,139	2.0
So. Division	3,057,283	3,396,606	D. 339,323	10 0
Iowa lines	1,421,352	1,350,236	I. 71.116	5 3
Ind., Dec. & Spr.	348.193	297,696	I. 50,497	16.9
K. C., Clint. & S.	192,117	....	.....	...
K. C., Ft S. & G.	2,038,788	2,116,100	D. 77,312	3.6
K. C., Spr. & M.	1,232,057	1,256.255	D. 24 198	1.9
Lake Erie & W.	1,063.613	981,579	I. 82,064	8 4
Lehigh & H. R.	177,286	145.772	I. 31,514	21.6
Marq., H. & O.	884,288	747,310	I. 126.978	18.3
Mem. & Charles.	1,090.443	1,029,954	I. 6 489	5.9
Mich. & Ohio	182,791	151,166	I. 31,625	20.9
Minn. & N. W.	370,765	....	.....	....
Nash., C. & St. L.	1,957,056	1,759,712	I. 197,344	11.5
Net earnings	782,202	711,132	I. 71,070	9.9
N. Y. City & No.	458,222	374,193	I. 84,029	22.5
St. L., A. & T. H.:				
Main Line	1,036,054	1,041,900	D. 5,846	0 6
Belleville Line	615.924	624,297	D. 8.373	1 3
St. L., Ark. & T.	1,365,347	949,419	I. 415,928	43.8
Texas & Pacific	4,569.041	4,260,785	I. 308,256	7.2
Tol. & Ohio Cen.	650,269	....	.....	....
Wisconsin Cent.	1,242 322	1,207,323	I. 34,999	2.9
Min., S. C. & W.	225,193	140,512	I. 84,681	60.1
Wis & Minn	243,453	124,656	I. 118,797	95.3
Nine months to Sept 30:				
Bur., C. R. & No.	$2,019,656	$2,164.096	D. $144,440	6.7
Net earnings	486.017	606,226	D. 120,219	19.9
Camden & Atl.	500.835	468,866	I. 31,969	6.9
Net earnings	136,983	140.894	D. 3,911	2.8
Cape F. & Y. Vy.	160,245	148,981	I. 11,264	7.6
Net earnings	78,429	67,736	I. 10,693	15.7
Dan. & Norwalk	176,299	168,260	I. 8,039	4 8
Denver & R. G.	4,750,696	4,415,529	I. 335,167	7.6
Net earnings	1,698,076	1,498 284	I. 199,792	13.3
Des. M. & Ft. D.	239,258	267,090	D. 27,832	10.3
Net earnings	47,185	69.484	D. 22,399	32.0
Maine Central	2,281,121	2,140,436	I. 140 685	6.6
Net earnings	941.362	873,925	I. 67,437	7.7
Mil., L. S. & W.	1,690,803	964,751	I. 726,052	75.2
Net earnings	731.138	306.767	I. 424,371	138.3
Minn. & St. L.	1,087,681	1,240,299	D. 152,618	12.3
Eight months to Aug. 31:				
California South.	$428,707	.....	.....	...
Deficit	28,504	.....	.....	...
Central Pacific	10,214,555	$9,335,139	I. $889,416	9.5
Net earnings	5.620 253	5,170,151	I. 450,102	8.7
Cl., C., C. & I.	2,575,897	2,272,063	I. 303,834	13.7
Net earnings	883,604	488,775	I. 394,829	80.8
Month of August:				
California South.	$63.761	.....	.....	....
Net earnings	4,321	.....	.....	...
Central Pacific	1,557,818	$1,370,516	I. $187,302	13.7
Net earnings	870,668	824,162	I. 46,506	5.6
Cl., C., C. & I.	408,538	341.161	I. 67,377	19.7
Net earnings	180,232	102,328	I. 77,904	76.1
Month of September:				
Buff., N. Y. & P.	$238,280	$238,398	D. $118	...
Net earnings	37,156	91,710	D. 54,554	59.5
Bur., C. R. & No.	297.853	299.973	D. 2.120	0.7
Net earnings	104,411	126.497	D. 22,086	17.5
Cairo, V. & C.	58,525	43,965	I. 14,560	33.1
Net earnings	14,519	8,033	I. 6,486	80.8
Camden & Atl.	59,877	56,031	I. 3,846	6.9
Net earnings	20,104	18,946	I. 1,158	6 1
Cape F. & Y. V.	20,580	19,961	I. 619	3 1
Net earnings	10,389	11,096	D. 707	6.4
Dan. & Norwalk	25,364	24.478	I. 886	3.6
Den. & R. G.	646,134	568,694	I. 77,340	13 6
Net earnings	274,171	223.909	I. 50,262	22.4
Des M. & Ft. D.	35,498	40.695	D. 5,197	12.7
Net earnings	16,144	16.449	D. 305	1.8
Maine Central	335,289	309,309	I. 25,980	8.4
Net earnings	174,560	175,840	D. 1,280	0.7
Mil., L. S. & W.	248,140	148,605	I. 99,535	67.0
Net earnings	119,117	70,034	I. 49 083	70.1
Minn. & St. L.	154.625	135,557	I. 19,068	14 0
Net earnings	63,766	42,811	I. 20,955	48.7
Minn. & N. W.	59,465	.....	.....	....
Net earnings	27,169	.....	.....	....
Month of October:				
Beech Creek	$108,000	.....	.....	...
Bur., C. R. & No.	316,204	$349.503	D. $33,299	5.2
California South.	64,058	.....	.....	...
Cape F. & Y. V.	24.241	22,353	I. 1.888	8 4
Central Iowa	132,968	147,943	D. 14.975	10.1
Cin., H. & Day	273,304	249.351	I. 23.953	9.6
C., Jack & Mack.	16,419	12,647	I. 3,772	29.9
Cin., N. O. & T. P.	285,460	257,163	I. 28.297	11 0
Col. & Cin. Mid.	29,519	21,754	I. 7,765	35.6
Cleve., Ak. & Col.	49,147	47,291	I. 1.856	3.9
Cleve. & Canton	33,816	27.119	I. 6,697	25.5
Net earnings	10,909	6,929	I. 3,980	57.7
Den. & R. G. W.	104.400	126,883	D. 22,483	17.7
Fla. Ry. & N.	79 598	81,218	D. 1,620	1.9
Ft. Worth & Den.	55,499	43,793	I. 11.706	26.6
Gulf, Col. & S. F.	261,694	304,773	D. 43.079	14.1
Hous. & Tex. C.	378,265	446,573	D. 68,308	15.3
Illinois Central:				
Ill. lines	639.782	646,420	D. 6,638	1.0
South. Div.	434,705	466,299	D. 31.594	6.8
Iowa lines	184,324	178,768	I. 5.556	3.1
Ind., Dec. & Spr.	41,266	34,182	I. 7,084	20.8
K. C., Clint. & S.	21.277	.....	.....	...
K. C., Ft. S. & G.	231,675	260.564	D. 28.889	11.1
K. C., Spr & M.	154,188	127,316	I. 26,872	21.2
Lake Erie & W.	116,379	103 590	I. 12.789	12.2
Lehigh & H. R.	20,607	17,019	I. 3,588	21.1
Manhattan Elev.	619.544	547,908	I. 71.636	13.1
Marq., H. & O.	110,096	106 558	I. 3.538	3 3
Mem. & Charles.	159.919	133,795	I. 26.124	19.5
Mich. & Ohio	22 698	20,297	I. 2,401	11 9
Minn. & N. W.	49,180	25,751	I. 23 429	90.8
Nash., C. & St. L.	213,200	191,846	I. 21.354	11.1
Net earnings	85 786	76 065	I. 9.721	12 8
N. Y. City & No.	50,681	45,370	I. 5,311	11.3
St. L., A. & T. H.:				
Main Line	128 659	131,564	D. 2,905	2.2
Belleville Line	88,838	86,377	I. 2,461	2.8
St. L., Ark. & T.	183,499	163,259	I. 20.240	12.4
Texas & Pacific	612,790	692,187	D. 79,397	11.5
Tol., A. A. & N. M.	33,949	28,603	I. 5,346	18 7
Tol. & Ohio Cent.	83.525	67,572	I. 15,953	23.5
Wisconsin Cent.	144,430	142,192	I. 2,238	1.6
Min., S. C. & W.	31,820	17,536	I. 14.284	82.8
Wis. & Minn.	47,955	16,045	I. 31,910	199.0
First week in November:				
Buff., Roch. & P.	$28,273	$27,551	I. $722	0 3
Cairo, V. & C.	14,599	9 301	I. 5,298	57.0
Canadian Pacific	252,000	203,000	I. 49,000	24.3
Chic. & Alton	171,155	170.489	I. 666	0.4
Chic. & Atlantic	36,973	26,969	I. 7,004	25.9
Chi. & East. Ill.	41,486	36,704	I. 4,782	13 0
Chic. & N. W.	597,300	564,300	I. 33.000	5.8
C., St. P., M. & O.	151,400	143,800	I. 7,600	5.3
Cin., H. & Day	58.078	54,913	I. 3,165	5.8
C., I., St. L. & C.	48,046	44,000	I. 4,046	9.2
Det., Lan. & No.	20,404	23.751	D. 3,347	14.0
Illinois Central	245,000	247,184	D. 2,184	0.9
Iowa lines	39.100	36,104	I. 2 996	8 3
Louisv. & Nash.	303,390	272.495	I. 30,895	11.3
L., N. A. & Chic.	38,004	38.224	D. 220	0 6
Mil. & Northern	13,281	10,625	I. 2 656	25
Norfolk & West.	74,665	58,511	I. 16,154	27.4
Ohio & Miss.	93,364	77,497	I. 15,867	20.6
St. L. & San F.	100,600	97.929	I. 2,671	2.7
St. P. & Duluth	37,649	38.540	D. 891	2 3
Wab., St. L. & P.	256.000	259,000	D. 3,000	1.2
Second week in November:				
Chi., Mil. & St. P.	$621.000	$634,030	D. $13,030	2.1
Den. & R. G.	168,000	133.696	I. 34,304	25.6
Mil., L. S. & W.	45,460	32,775	I. 12,685	37.9
St. Louis & San F.	112,900	111,700	I. 1,200	1.1

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

RAILROAD LAW.

Tracks in City—Municipal Ordinance.

In the case of the City & Suburban Railroad Co. against the Mayor and Corporation of Savannah, the Georgia Supreme Court affirms the judgment of the lower Court, holding as follows:

1. Under a provision in the charter of a municipal corporation giving it power "to make, ordain and establish such by-laws, ordinances, rules and regulations as shall appear to them requisite and necessary for the security, welfare and convenience of the said city and its inhabitants, and for preserving health, peace and good government within the limits of the same," the municipal authorities were authorized to pass an ordinance requiring street railroad companies to keep their tracks watered so as to lay the dust, and imposing a fine for failing so to do.

2. The defendant in this case was a successor of the Savannah, Skidaway & Seaboard Railroad Co., the charter of which only granted the right to construct the road outside of the city; and an ordinance passed in 1868 gave it the power to construct and run within the city limits; and in that ordinance it was provided that said company and its agents shall be under the same police regulation and liable to fine as other persons for violation of the ordinances of the city of Savannah, which was confirmed by the General Assembly. Therefore, the defendant was subject to such an ordinance by its charter. Even if the company had not so submitted itself to the police regulations and ordinances of the city on entering it, it would be subject thereto.

3. An ordinance requiring all companies operating street cars in the city to water their tracks so as to keep the dust laid, was not so partial and wanting in generality as to vitiate it.

OLD AND NEW ROADS.

Allegheny Valley.—Mr. John Scott and Mr. W. H. Barnum, Receivers of this road, have filed an answer to the petition recently presented to the Court by D. S. Jones and others, income bondholders, in which they deny the charges made in the former petition, and say that the road has not been run in the interest of the Pennsylvania or any other company, but has been operated, as far as possible, to secure the best results from the property. They also claim that they have faithfully attended to their duties, and have not either of them been incapacitated for performing them by sickness or otherwise for any length of time.

Anniston & Atlantic.—This road is now completed to Syllacauga, Ala., 6 miles beyond the late terminus at Sycamore and 15 miles from Anniston. Work is to be begun on a further extension of 6 miles.

Atlantic & Pacific.—The Boston *Advertiser* of Nov. 11 says: "The details of the Atlantic & Pacific guarantee are now practically completed, and we are now at liberty to give the following facts in regard to the arrangement which has been entered into by the three companies:

"1. The adoption of the plan is contingent upon its being accepted by a majority of the bondholders on or before Dec. 27, 1886. The new bonds will be dated Jan. 1, 1887, running 50 years, and the total issue will amount to $20,000,000.

"2. As the coupons upon the Western Division 6s are now payable in July and January, and the coupons upon the Central Division 6s are now payable in March and September, $20 in cash will be given with each $1,000 Western Division bond and $13.33 with each Central Division bond to adjust the interest to Jan. 1, 1887.

"3. The separate guarantee of the St. Louis and San Francisco and the Atchison, Topeka & Santa Fe companies, by which each company guarantees one-half the principal and interest of each bond, is to be stamped upon every bond.

"4. The Central Division is to be completed at once to a junction with the Southern Kansas extension through the Indian Territory, and the Central Division of the Atlantic & Pacific is to be operated by the St. Louis & San Francisco.

"5. The Western Division is to be operated hereafter by the Atchison, Topeka & Santa Fe.

"6. The California Southern is to have a traffic rebate from the Atchison, Topeka & Santa Fe, the St. Louis & San Francisco, and the Atlantic & Pacific companies upon all business coming to or from the line over those roads. This rebate is demanded from the fact that the California Southern will originate and receive a great deal of business of which it will only get a short haul itself, but will furnish a long haul for the other roads.

"7. All the earnings of the Atlantic & Pacific above 4 per cent. will go to pay past and future arrears of interest, and to clear off the floating debt. The Western Division 6s mature in 1910, and the new 4s will run to 1937. While no definite provision was made as to the disposition of the earnings above 4 per cent. after all arrears of interest have been paid, there can be no doubt that such excess of earnings will belong to the holders of the junior securities—incomes and stock.

"In fact, it is intimated that the Atchison, Topeka & Santa Fe and St. Louis & San Francisco companies have been offered above the present market price for the balance of Atlantic & Pacific stock up to $100,000,000, now authorized but not yet issued."

Baltimore & Ohio.—Work has been begun on the building of a second track on the Metropolitan Branch, and it is expected that by next spring the line will be double track from Washington to Gaithersburg, a distance of 20 miles.

The company is now building a branch from the main line, 3 miles west of Oakland, Md., along the Youghiogheny River, to a large tract of timber land owned by the company. This branch will be about 8½ miles long. It is said hat it will be extended hereafter to Yough Manor, some 9

miles further, running through a large tract of heavy timber and reaching some coal lands not now developed. The probability is that the road will be continued through to Confluence, on the Pittsburgh Division, in time.

Batesville & Brinkley.—This road is now completed to Jacksonport, Ark., 4 miles north of the late terminus at Newport and 60 miles from the southern terminus at Brinkley. The trains began to run to the new terminus on Nov. 8

Beech Creek.—The Reorganization Committee will pay a dividend of 5 per cent. to the stockholders of the old Beech Creek, Clearfield & Southwestern Co. from the surplus remaining in its hands after winding up the affairs of that company.

Boston & Maine.—This company's statement to the Massachusetts Railroad Commission for the year ending Sept. 30 gives the following figures :

Earnings ($13,471 per mile)		$7,543,691
Expenses (63.2 per cent.)		4,767,300
Net earnings ($4,958 per mile)		$2,776,391
Interest	$289,934	
Rentals	1,365,117	
Eastern R. R. proportion of surplus	421,340	
Dividends, 8½ per cent	595.000	
		2,671,391
Balance, surplus for the year		$105,000

No comparisons are made, as the company during the year operated the Worcester, Nashua & Rochester road for nine months, and its earnings are included above, but not in the previous year.

Buffalo, Rochester & Pittsburgh.—This company has decided to make its principal repair shops at Bradford, Pa., the present shops at Rochester and Buffalo being retained only for light repairs. The division headquarters for both divisions will also be located at Bradford, and all train-dispatching will be done from that point.

The statement to the New York Commission for the quarter ending Sept. 30 is as follows :

	1886.	1885.	Inc or Dec.	P.c.
Earnings	$383,563	$350,423	I. $33.140	9.5
Expenses	256,995	236,902	I. 20,093	8 5
Net earnings	$126,588	$113,521	I. $13.047	11.5
Other receipts	92,000		I. 92,000	....
Total income	$218,568	$113.521	I. $105,047	92.1
Interest, rentals and taxes.	108,666	122,202	D. 13.536	11.1
Surplus	$109,902	*$8,681	I. $118,583	....

* Deficit.

The large item of $92,000 under "other receipts" is not explained. Without it, the quarter this year would show a surplus of only $17,902.

The appointment of a receiver for the Rochester & Pittsburgh Co., noted last week, is understood to apply only to the old company and to such assets as may remain in its possession.

Cairo, Vincennes & Chicago.—The statement of earnings for the month of September is as follows:

	1886.	1885.	Inc. or dec.	P.c
Earnings	$58,525	$43.965	I. $14.560	33.1
Expenses	44,006	35.932	I. 8,074	22.4
Net earnings	$14.519	$8,033	I. $6,486	80.8
Per cent. of expenses	75.2	81.2	D. 6 0	....

Expenses include taxes. This line continues to show a very large increase. The earnings for September this year were $221 gross, and $55 net per mile.

Canadian Pacific.—The mason work and substructure of this company's new bridge over the St. Lawrence River at Lachine, near Montreal, was completed Nov. 12, a little over two weeks ahead of the contract time. The substructure includes 12 piers, containing altogether about 10,000 cubic yards of masonry, which have been built since May 12, in water from 18 to 35 ft. deep, with a very rapid current. The contract price for the substructure was $750,000.

Caraquet.—This road now has track laid from Bathurst, N. B., on the Intercolonial road, 55 miles, leaving only 15 miles to be laid to finish the line, which will then extend from Bathurst, along the south shore of Chaleur Bay to Shippegan, a distance of 70 miles. A mixed train is run over the completed section of the road, and there is already considerable traffic. The line will be entirely completed in the spring, and it is already proposed to build an extension from Shippegan to Tracadie, a distance of 12 miles.

Carolina Central.—The extension of this road is now completed to the Second Broad River, 21 miles west of the old terminus at Shelby, N. C. Six miles remain to reach Rutherfordton, the grading on which is completed, and the track will be laid as soon as the Broad River bridge is finished. On the 27 miles of the new extension there are 5 large iron bridges, besides a number of smaller crossings.

Centralia & Chester.—The grading of this road is now nearly completed from Centralia, Ill., to Nashville, and tracklaying will shortly be begun.

Central, of Georgia.—A Savannah dispatch of Nov. 17 says : "It is positively stated that Mrs. Hetty Green, of New York, sold her 6,450 shares of Georgia Central Railroad stock to-day. The Gen. Alexander Syndicate was the purpurchaser at 140, private sale. The market was excited, the stock selling at 112. Gen. Alexander is announced as a candidate for the Presidency of the road in opposition to Mr. Raoul."

Central Pacific.—The statement of earnings and expenses of this road for August is as follows :

	1886	1885	Increase.	P. c.
Earnings	$1,557,818	$1,370 516	$187,302	13.7
Expenses	687,150	546,354	140,796	25.8
Net earnings	$870,668	$824,162	$46,506	5.6

Interest and all other charges for the month this year amounted to $564,606, leaving a profit of $306,062 for the Southern Pacific Co. as lessee.

Charleston, Cincinnati & Chicago.—On this company's line, which is being built by the Massachusetts & Southern Construction Co., track is reported laid from Blacks, N. C., on the Atlanta, Charlotte Air line, northward for 14 miles, leaving only 3 miles to be laid to complete the road to Shelby, N. C., and the company promises to run a train through to Shelby at the end of the present month.

Chateaugay.—The extension of this road from the old terminus at Lyon Mountain, N. Y., westward to Loon Lake, 16 miles, is completed and was opened for traffic Nov. 15. The road is now 50 miles long, from Plattsburg, N. Y., to Loon Lake, and the extension carries it well into the Adirondack regions. Stages connect at the terminus for the Saranac lakes and other points.

Chicago City Passenger.—Mr. D. J. Barnes, Engineer of this company, informs us that the company has just completed the work of laying track, having built this year 12 miles of street railroad in the most populous part of the city. The company has now 21 miles in operation in Chicago and is doing a good business.

Chicago, Kansas & Western.—The articles of incorporation filed by this company in Illinois, noted briefly last week, provide for the construction of several different lines. The first one starts from the Mississippi River, opposite Fort Madison, Ia., and is to run by the straightest practicable line to Chicago, with a branch to a point opposite Keokuk, Ia. The second line specified in the articles provides for a line from a point opposite Fort Madison to Chicago by a more northern route than the first one. The third line provided for is from a point on the first line in Knox County to Peoria and thence eastward to the Indiana line. The fourth line is from a point in Knox County to Rock Island, with a branch to the Mississippi River at a point opposite Muscatine, Ia., and the fifth line provides for a branch to the northern line of the state of Illinois.

As noted, all the incorporators of the new company are officers or directors of the Atchison, Topeka & Santa Fe., and the incorporation is evidently intended to provide for the Illinois end of the company's proposed extension from Kansas City to Chicago.

Chicago, Milwaukee & St. Paul.—This company's limited express now runs from Chicago to St. Paul, by way of Milwaukee and La Crosse, in 12 hours and 20 minutes, and between Chicago and Minneapolis in 12 hours and 55 minutes, the average speed being 32½ miles an hour, without allowance for stops.

Chicago & Northwestern.—This company announces the completion of an extension of the Maple River Railroad, from Mapleton, in Monona County, Ia., to Onawa, in the same county, a distance of 20.7 miles. The stations on the extension are Castana, Turin and Onawa. The line was opened Nov. 15

The extension of the company's Toledo & Northwestern line from Lake City, in Calhoun County, Ia., to Wall Lake Junction, in Sac County, 15.4 miles, was also opened for business Nov. 15. The new stations are Auburn and Wall Lake Junction, the last named place being 3.7 miles southeast of Wall Lake.

Chicago & West Michigan.—It is reported that surveys are to be made for an extension of this road from Baldwin, Mich., south to Traverse City and that arrangements are being made to begin work on this extension in the spring.

Cincinnati & Eastern.—The Court has decided that the balance of the purchase money on this road must be paid by Nov. 18, and if full payment is not made on that day a re-sale of the road will be ordered. The road, it will be remembered, was purchased at foreclosure sale by Mr. Albert Netter, of Cincinnati, who made the first payment but defaulted on the second.

Cincinnati, Hamilton & Dayton.—Notice is given of a special meeting of stockholders, to be held Nov. 30, to vote upon a proposition to issue additional preferred stock for the purpose of retiring bonds of the company and stocks and bonds of leased roads upon which the company guarantees interest, and also for the purpose of constructing additional tracks and branches and purchasing other lines. This is not to increase the amount of preferred stock already authorized.

As noted elsewhere, the company has purchased a controling interest in the stock of the Dayton & Ironton road, extending from Dayton to Dean, 156 miles. A portion of the new issue of preferred stock is probably intended to pay for this purchase. The line thus bought will give the company a road into southern Ohio coal fields. The Dayton & Ironton is now of 3 ft. gauge, but it is understood that it is to be changed to standard gauge and extended into the Hocking Valley.

Negotiations have also been in progress for the purchase of the Iron Railroad, extending from Dean to Ironton on the Ohio River.

Cincinnati, New Orleans & Texas Pacific.—A Cincinnati dispatch of Nov. 15 says : "The Superior Court, sitting in General Term, to-day affirmed the judgment of the lower court in the case of Rawson against the Cincinnati, New Orleans & Texas Pacific Railroad Co. This is one of the cases brought by a number of banks against the company on certificates of stock which the company claims were issued by George F. Doughty, now deceased, without authority. The overissue amounted to nearly $35,000. At the trial of the case, which now goes to the Supreme Court, there was a failure on the part of the company to show that the certificates upon which the issue was made were unauthorized certificates. There was a possibility that the certificates in question represented a part or all of some genuine certificates which had been presented by the holder for transfer, and the jury, which the company claims was strongly prejudiced against it, found upon the showing that the certificates were valid.

"The reviewing Court refused to set the verdict aside for the reason that the probability that the jury was wrong was not sufficiently clear to warrant, under the Ohio law, an interference with it. The policy of the company will now be to fight the case in the Supreme Court, and, failing there, to refuse to recognize the validity of other disputed certificates, and when judgment is sought to seek to show the character of these certificates absolutely by tracing the history of every valid certificate issued by the company prior to Doughty's death. Doughty was the Secretary of the company. The fraudulent certificates which he issued were signed by the President of the company in blank. Doughty borrowed large sums of money upon the fraudulent certificates, which he invested in the securities of the Cincinnati, Selma & Mobile Railroad. These securities at the time of his death and ever since have been almost worthless."

Cleveland, Columbus, Cincinnati & Indianapolis.—The statement for August and the eight months to Aug. 31 is as follows :

	August.		Eight months.	
	1886.	1885.	1886.	1886.
Earnings	$408,538	$341,161	$2,575,896	$2,272,063
Expenses	228,305	238,833	1,692 292	1,783,288
Net earnings	$180,232	$102 327	$883.603	$488,774
Interest, taxes, etc	69.703	71,677	552.545	535,719
Surplus	$110,528	$30,650	$331,058	*$46,924

* Deficit.

Expenditures for additions to property this year were $22,626 for August and $143,607 for the year, leaving a net surplus of $87,902 for the month and $187,451 for the eight months.

Concord.—This company has applied to the Supreme Court, in accordance with the New Hampshire law, for leave to consolidate with the Manchester & North Weave and the Suncook Valley companies. The Manchester & North Weave road extends from Manchester to North Weave, 19 miles, and has $200,000 capital stock. The Suncook Valley road runs from Suncook to Pittsfield, 17¼ miles. Both roads have been for years leased and worked by the Concord Co., and are practically owned by that company, so that the consolidation will make only a formal change.

Dayton & Ironton.—A majority of the stock of this company, about 3,500 out of the 6,000 shares, has been sold to parties representing the Cincinnati, Hamilton & Dayton Co., at 90. The road extends from Dayton to Dean, 156 miles. It was formerly a part of the Toledo, Cincinnati & St. Louis system, but was some time ago sold under foreclosure and bought by the bondholders. The present company has no bonded debt, although an issue of bonds was proposed for the purpose of changing the line from 3 ft. to standard gauge and purchasing equipment.

The sale of the stock has excited considerable indignation among the minority stockholders, who claim that they should have been given an opportunity of disposing of their stock, which now sells at a very much lower price than that paid for the controlling interest.

Delaware, Lackawanna & Western.—This company makes the following statement to the New York Railroad Commission for its leased lines in that state for the quarter ending Sept. 30 :

	1886.	1885.	Inc or Dec.	P. c.
Earnings	$1,763,509	$1,653,404	I $110,105	6.7
Expenses	756.841	620.172	I 136,669	22 4
Net earnings	$1,006,668	$1.033,232	D. $26,564	2.6
Fixed charges	552 749	565,257	D. 12,508	2.2
Surplus	$453,919	$467.975	D. $14 056	3.0

Fixed charges include interest, rentals and taxes paid for the quarter. As usual, the operating expenses of these lines were low, having been only 42.9 per cent. of gross earnings for the quarter this year and 37.5 per cent. last year.

Denver, Memphis & Atlantic.—The Fitzgerald & Mallory Construction Co., contractor for this road, makes the following report: "The following is a report of track laid on the Denver, Memphis & Atlantic Railway for the month of October : Chetopa Division from a point 4 miles west of Coffeyville to a point 0.5 miles west of Tyro, 8.4 miles; Conway Springs Division from Kingman to a point 0.5 miles east of Penelosa, distance 12.2 miles, making a total for the months of 20.6 miles."

Detroit, Lansing & Northern.—It is reported that this company will commence next season to build a branch from its line at Grand Ledge, Mich., 97 miles from Detroit, westward to Grand Rapids. Surveys have already been made for such a branch, the object of which, it is said, is to provide a direct connection with the Chicago & West Michigan, and in connection with that road a new line from Detroit to Traverse City.

Duluth & Wisconsin.—This company has been organized to build what is known as the Duluth Short Line, running from Thompson Junction, on the St. Paul & Duluth road, to Oneota, with a branch to West Superior. The capital stock is $500,000.

Durham, Bluewing & Clarksville.—This company has been organized to build a railroad from Clarksville, Va., the terminus of the Richmond & Mecklenburg Branch of the Richmond & Danville road, southward to Durham, N. C., a distance of about 60 miles. The company has secured subscriptions of $100,000 along the line, and now asks the merchants of Richmond to raise an equal amount.

East Georgia & Florida.—A Savannah dispatch says that this unfinished road has been sold to the Savannah, Florida & Western Co. for $500,000. It has been under construction from Jesup, Ga., to Hart's Road, Fla., and some grading is finished. It was generally supposed that the road was in the East Tennessee, Virginia & Georgia interest.

East Tennessee, Virginia & Georgia.—Reports are current that this company, or parties largely interested in it, will shortly begin the construction of an extension of the Memphis & Charleston road from Memphis to Kansas City.

Elmira, Cortland & Northern.—The grading of the extension of this road from Canastota, N. Y., to Camden, is now nearly completed. The principal work remaining to be done is the bridges over the New York Central tracks and the Erie Canal at Canastota. As soon as these are completed tracklaying will be begun.

Fitchburg.—The statement to the Massachusetts Railroad Commission for the year ending Sept. 30 last gives the following figures :

	1885-86.	1884-85.	Increase.	P. c.
Earnings	$3,399.542	$2,891,251	$508,291	17.6
Expenses	2,.59,685	2,146,961	412.704	19 2
Net earnings	$839.877	$744,290	$95,587	12 9
Interest and rentals	517.243	473 269	43,974	9.3
Dividends	264,330	247,500	16 830	6.8
Total	$781.573	$720,769	$60.804	8.4
Surplus	$58,304	$23,521	$34,783	147.9

Dividends were 5 per cent. in both years. The full annual report will not be issued for several weeks.

It is said that the next dividend will be 3 per cent., an increase over any declared by this company for several years past.

Florida Midland.—This company has under construction a railroad running from Lake Jessup, Fla., the head of navigation of the St. Johns River, southwest to Apopka, and thence south to Kissemee, a distance of about 50 miles. When this section is finished the road will be continued from Kissemee southward to Punta Rassa, on Charlotte Harbor, a distance of 150 miles further. The line south of Apopka will be parallel to but some 35 or 40 miles to the eastward of the Florida Railway & Navigation Co.'s southern extension. On the line from Lake Jessup to Kissemee a large part of the grading is already completed, and the track was laid for 25 miles on Nov. 3. The rails and the equipment for the entire have been contracted for. The road is built under a special charter granted by the Florida Legislature, under which it is entitled to a land grant of 3,840 acres per mile, and some 80,000 acres of this land have already been located. The authorized issue of bonds of the company is $8,000 per mile, bearing 6 per cent. interest. The northern end of the line as far as Kissemee passes through a country already well settled and prosperous, and the company has received a considerable amount in donations of land and money from villages on the line.

Ft. Worth & Denver.—The grading on the extension of this road is nearly completed to Quanah, but tracklaying has been suspended to await the completion of the heavy bridge work at the crossing of Pease River, just beyond the present terminus at Vernon. It is expected that the track will be laid to Quanah next month, when work will be suspended until the Spring.

It is stated that the company has made arrangements for the building of the extension to the Canadian River next year, work to be begun early next spring and to continue until the road is finished.

Grafton & Greenbrier.—Contracts have been let for an extension of this road from its present terminus at Philippi, W. Va., to Bealington, a distance of 17 miles, and work has been begun on the grading. It is reported that the road

will be extended through Buckhannon to Braxton Court House, and thence down the Elk River to Charleston, W. Va. The road is now in operation from Grafton, on the Baltimore & Ohio, to Phillippi, 24 miles, and is controlled by the Baltimore & Ohio. The line now in operation is of 3 ft. gauge, but the bridges and other work on the extension are being built for the standard gauge, and the present line will probably be changed shortly.

Gulf, Colorado & Santa Fe.—On the extension of the Dallas branch, from Dallas, Tex., northeast, track is now laid to Wolf City, Tex., 90 miles from Dallas and 8 miles beyond the late terminus at Celeste.

On the extension from Fort Worth northward the grading is completed to the Red River, 72 miles from Fort Worth, and track has been laid for 57 miles. A large force is at work in the Indian Territory north of the Red River.

Houston & Texas Central.—At a special meeting held in Galveston, Tex., Nov. 6, this company sold 278,320 acres of its Texas land grant to J. G. Schriver, of New Orleans, attorney for Edward H. Pardee, of New York. The price paid was $10,000, the land being taken subject to the lien of the company's mortgages. As heretofore noted, this sale was made in order to comply with the state law, which provided that the company must alienate its title to the land granted within 21 years from the date of the grant. This period expired Nov. 10.

Illinois Central.—The Traffic Department makes the following statement of earnings for the month of October:

	1886.	1885.	Inc. or Dec.	P. c
Ill. and So. Div.	$1,074,487	$1,112 719	D. $38,232	3 4
Iowa lines	184 324	178,768	I. 5,556	3.1
Total.	$1,258,811	$1,291,487	D. $32,676	2.5

The Land Department reports sales of 1,062 acres for $4,749. Collections on land accounts amounted to $7,709 for the month.

Illinois Midland.—The arguments on the motion to confirm the foreclosure sale of this road were heard last week before Judge Harlan, in Washington. The confirmation was opposed by certain parties in interest, and the Judge stated that he would not render a decision until Nov. 22.

Kansas City, Memphis & Birmingham.—The Memphis, Birmingham & Atlantic road, from Holly Springs, Miss., to Tupelo, was turned over to this company, Nov. 1. The track from Holly Springs westward is now laid to New Albany, 35 miles, and from Tupelo eastward the track is at Wallerville, 20 miles, leaving a gap of about 6 miles yet to be laid. The work on the Tupelo end has been suspended for the present. The tracklaying is in charge of Principal Assistant Engineer A. W. Gloster, who is now organizing work trains and surfacing force to put the track in first-class condition. The contractors on the line from Tupelo eastward are making good headway. They have an abundant supply of labor, and no difficulty is expected in completing the work in the required time. A contract for the piling and trestle-work for about 70 miles of the Western Division has been let to Messrs. Rogers & Ballentine, of New Orleans. Mr. R. C. Armstrong has been awarded a large contract for cross ties.

Lehigh Valley.—Grading has been completed on the new branch known as the Wilkes-Barre & Harvey's Lake road, and tracklaying was begun this week. The line runs from a connection with the Coxton Branch of the Lehigh Valley at Luzerne to Harvey's Lake, a distance of 14 miles. It is said that the intention is to extend the branch into a large lumber tract on the North Mountain, and, eventually, to build it through to Lock Haven, where connections can be made for bituminous coal business.

Little Rock, Mississippi River & Texas.—The United States Circuit Court in Little Rock, Ark., has granted a decree of foreclosure and sale against this road. Arrangements have been substantially completed for the purchase of the road by the bondholders and the reorganization of the company.

Los Angeles & San Gabriel Valley.—This road is now completed to Duarte, Cal., 21.2 miles from Los Angeles. The latest time-table, which took effect Nov. 5, shows three regular passenger and one freight train between Los Angeles and Duarte, with three additional passenger trains and one freight running between Los Angeles and Lamanda Park. Work is progressing on the extension from Duarte eastward to Mud Springs.

Louisville, Cincinnati & Dayton.—This projected line is to run from Middletown, O., to Hamilton, thence to Lawrenceburg, Ind., and thence along the north side of the Ohio to a point opposite Louisville. The line has been surveyed and some grading done. The officers of the company are now trying to make some arrangement to secure the aid of the Cleveland, Columbus, Cincinnati & Indianapolis Co. in building the road.

Macopin.—This company has been organized to build a railroad from Charlotteburg, N. J., to Echo Lake, or Macopin Pond, a distance of 3 miles, with a branch about 2 miles long to Dunker Pond. The road will be a branch of the New York, Susquehanna & Western and will be used chiefly for carrying ice from the ponds named, where large ice-houses have been erected, although it is expected to have some passenger travel in the summer time.

Milwaukee & Northern.—This company has let a contract to Harrison & Green, of Milwaukee, for the building of an extension from its present terminus at Iron Mountain, Wis., northward to a connection with the Marquette, Houghton & Ontonagon road at Republic, Mich. This extension will be 45 miles long, and is to be completed by Aug. 1, 1887. The road is now in operation from Milwaukee northward to Iron Mountain, 208 miles, so that the extension will make the main line 253 miles long. When the line is open to Republic it will complete a second line from Marquette to Milwaukee and Chicago.

Mobile & Ohio.—The change of gauge of the Cairo & St. Louis road having been completed, this company began on Nov. 15 to run through trains between St. Louis & Mobile. Two express trains are run daily, starting from the Union Depot in St. Louis and crossing the bridge.

Nashville, Chattanooga & St. Louis.—The statement for October and the four months of the fiscal year from July 1 to Oct. 31 is as follows:

	October.		Four months.	
	1886.	1885.	1886.	1885.
Earnings	$213,200	$191.846	$876 254	$7.2,494
Expenses	127,414	115 781	511 246	433,441
Net earnings	$85,786	$76,065	$365,008	$299 053
Interest and taxes			232,263	225,162
Improvements			23.3 3	18,436
Total			$256,586	$243,601
Surplus			$108.422	$55.452

This shows for the four months an increase of $143,760, or 19.6 per cent., in gross earnings; an increase of $65,955, or 21.9 per cent., in net earnings; and a gain of $52,970, or 95.5 per cent., in the surplus.

New York, Chicago & St. Louis.—The Receiver's statement for the quarter ending Sept. 30 is as follows:

	1886.	1885.	Increase.	P. c.
Earnings	$905,198	$737,025	$168,173	22.8
Expenses	637,000	576,089	60,911	10.6
Net earnings	$268,198	$160,936	$107,262	66.6
Charges	102,103	94,016	8,087	8.6
Surplus	$166,095	$66,920	$99.175	148.0

Charges include rentals and taxes, but not interest on the bonds, which was not paid.

New York, Lake Erie & Western.—This company having taken a lease of the New York & Greenwood Lake road, in which it has previously owned a large interest, it is reported that that road will be extended from its present terminus at Greenwood Lake to a connection with the main line of the Erie at or near Middletown. The distance is about 20 miles, and should the extension be completed it will form a loop line from the main line of the Erie, just west of the Bergen tunnel, to Middletown. This line would be somewhat shorter than the present main line of the road, but the Greenwood Lake road would have to be almost entirely rebuilt to enable it to carry a heavy traffic. The extension, however, should be profitable, as it passes through a good country, and would bring to the Erie some additional milk traffic.

New York, New Haven & Hartford.—This company has decided to advance the pay of all the freight train men in its service. The pay of the rear brakeman has been increased from $50 to $54.60 per month, and all other brakemen will receive $52, an increase of $4. New men coming on the road will receive $42.40 per month for six months, when they will be advanced to full wages.

The car shops in New Haven are to be enlarged by two new buildings of brick, one 179 by 80 ft., for a repair shop, the other 80 by 50 ft., being arranged as a storehouse below, with offices on the second floor.

The statement to the Massachusetts Commission for the year ending Sept. 30 gives the following figures:

	1885-86.	1884-85.	Inc or Dec.	P. c.
Earnings	$7,601,947	$6,895,825	I. $706,122	10.2
Expenses	4,967,976	4,623,987	I. 343,989	7.4
Net earnings	$2,633 971	$2,271,838	I. $362,133	15.9
Interest and rentals	493,730	500,970	D. 10,240	2.0
Dividends	1,550,000	1,550.000	.....	....
Total	$2,040.730	$2,050,970	D. $10,240	0.5
Surplus	$593,241	$220,868	I. $372,373	168.6

Dividends were 10 per cent. in both years. The company's full annual report will not be issued for several weeks.

New York, Ontario & Western.—The work of replacing the old iron rails on this road has been completed, and the main line is now all laid with steel rails.

It is said that the Ellenville Branch will be extended from its present terminus at Ellenville, N. Y., to Rondout, or to a junction with the Ulster & Delaware near that place. The extension will be very nearly parallel to the line of the Delaware & Hudson Canal.

Norfolk & Virginia Beach.—The property of this company has been placed in the hands of a receiver by order of the United States District Court, on application of the creditors. The road extends from Norfolk, Va., to Virginia Beach, 6 miles below Cape Henry, and is 18 miles long. The company also owns a large hotel and other property at the terminus of the road.

Oregon Railway & Navigation Co.—Negotiations have been resumed for a lease of this company's line to the Union and Northern Pacific companies. It is said that the company insists upon 6 per cent. on the stock, and that the Union Pacific people are willing to pay that much, but that the Northern Pacific has so far refused to give over 5 per cent.

Pennsylvania.—The Schuylkill Valley Division is now completed and was opened for business on Nov. 15 to New Boston, 12½ miles beyond Pottsville and 107 miles from Philadelphia. At New Boston connection is made with the Lehigh Valley road, and the track of that road will be used to Delano, from which point a line is now under construction to a connection with the Pennsylvania's North & West Branch.

The building of the Schuylkill Valley Division has required some heavy work, not only from the nature of the country, but also from the necessity of avoiding interference with existing railroads, especially with the Philadelphia & Reading, to whose main line the new road is nearly everywhere parallel.

Surveys are being made for the extension of the East Brandywine & Waynesburg Branch from its present terminus at New Holland, Pa., to Lancaster. This extension will make the branch a loop line from Downingtown to Lancaster. The extension will be about 25 miles in length.

Philadelphia & Reading.—Mr. Austin Corbin, the new President and Receiver, is making arrangements to reduce expenses in every possible way in the management of the company. It is stated that the New York and London offices are to be dispensed with, and the finer expenses are to be reduced at every possible point. Mr. Corbin is also endeavoring to cut down the expenses of the Reading Coal & Iron Co. by improvement of methods of handling coal, and will also try to lease the company's blast furnaces in the Schuylkill Valley, which are not now productive, and its iron lands in the Cumberland Valley in Pennsylvania and in Virginia and New York.

The Philadelphia *North American* of Nov. 17 says: "The committee of the Reading Railroad Reorganization Trustees met yesterday morning, and after a brief session adjourned until Friday. On that day it is understood that the plan of rehabilitation will be submitted to the Board of Trustees for their approval.

"A member of the committee stated that the work was practically finished and that it would now remain for the security holders to accept the results of the labor. Bonds for $25,000,000 will be issued at 4 per cent., and it is said that the most prominent banking houses in this country will head the subscription list. Means for promoting reciprocal relations between the Pennsylvania and the Baltimore & Ohio are taken in the interest of the Reading. The coal lands are understood to be disposed of by lease or otherwise, and other great reductions in expenses are made. Leased line contracts are kept intact where they pay. It is said that some concessions have been made to the first series 5 per cent. bondholders' party."

Port Jervis & Monticello.—The receiver of this road made the necessary deed on Nov. 15, transferring the road to Henry R. Low, O. P. Howell and Peter E. Farnham, the purchasers at the recent sale, and on the same date formally transferred possession of the property. The new owners have organized a company under the name of Port Jervis, Monticello & New York. The articles of incorporation provide that the new company shall have the right to extend the road from Monticello to a junction with the New York, Ontario & Western at Fallsburg, or from Rose's Point to Wurtsboro.

Richmond, Fredericksburg & Potomac.—In the United States Circuit Court in Richmond, Va., Nov. 16, a bill was filed by Moncure Robinson and others, stockholders, against B. F. Newcomer, W. P. Walters and others, charging that certain shares of stock in this company had been put in the hands of defendant by feigned or fictitious sales, and that the defendant had distributed these shares among a number of employés by further fictitious sales, and that these shares are not really owned by these reputed holders, and that the object of these transfers was to avoid the effect of the Virginia law, which reduces the number of votes to be cast by the holders of a large number of shares, and that the effect of these transfers will be to give the stock named about 4,700 votes, when it would have only about 800 votes if all the shares were registered in the name of the real owners. Plaintiff asked that the Court should appoint a commissioner to be present at the annual meeting and to make a report to the Court of the votes cast, by whom they were cast, and the ownership of the stock. The Court granted the order asked for and appointed a commisssioner, who will make a registry of the votes and report the same to the court for such further action as may be directed in the suit.

Richmond & West Point Terminal Co.—The new party headed by Mr. Alfred Sully, of New York, have now, it is announced, secured over 120,000 shares out of a total of 150,000 shares of this company, and at the annual meeting to be held in Richmond on Friday of this week, Mr. Sully will be elected President, with other members of the syndicate as directors. Exactly what the course of the new management toward the Richmond & Danville Co. will be is not yet announced, but it is reported that negotiations are going on for a consolidation of the two companies.

Rome, Watertown & Ogdensburg.—This company has been purchasing property in Rochester, N. Y., evidently with the intention of extending its line into the city and across the Genesee River, and of laying tracks to connect with the principal factories in the city.

St. John Valley.—Surveys have been completed for this road from Fredericton, N. B., to Woodstock, 62 miles, and construction will be begun in the spring. Plans have been completed for a bridge over the St. John River at Fredericton. This bridge will have a draw span of 160 ft., 1 fixed span of 158 ft., 1 of 170 ft. and 7 of 250 ft. each.

St. Joseph & Grand Island.—Amended articles of incorporation of the Kansas City & Omaha Co., which was organized to build this company branches and extensions in Nebraska, have been filed. The company under these amended articles proposes to build lines as follows: From Fairfield, in Clay County, through Nuckolls and Clay counties to the south line of Nebraska near Hardy; from Fairfield through Clay, Fillmore and York to Stromsburg; from Davenport in Thayer County, through Fillmore and York counties to Stromsburg; from Fairbury in Jefferson County, through Saline, Fillmore and York condties to Stromsburg; from Fairfield through Adams, Kearney, Phelps, Gosper, Frontier, Dawson and Lincoln counties to the town of Ogallala, in Keith County; from a point on the last described line, near the west line of Adams County, southwest through Kearney, Phelps, Harlan, Furnas and Red Willow counties to a point on the south boundary of the state of Nebraska, with the right to connect with a railroad to be constructed from the last mentioned point to and into the state of Kansas; and from the west line of Adams County aforesaid to the city of Hastings in said county; and from the town of Clay Centre through the town of Harvard to Aurora in Hamilton County, and from the town of Sutton in Clay County to the town of Seward in Seward County, all of the aforementioned lines or routes being situated in the state of Nebraska.

St. Paul, Minneapolis & Manitoba.—The new issue of $5,100,000 of this company's consolidated 4½s were offered for subscription in New York, Berlin and Hamburg on Nov. 12, by Kuhn, Loeb & Co., who took the entire issue. The notice given said that subscriptions would be received until Nov. 16, but before the close of the first day it was announced that all the bonds had been taken.

San Francisco & North Pacific.—The work of locating the extension of this road from Cloverdale, Cal., to Ukiah is completed, and the survey is to be completed from that point to Humbold Bay. It is said that construction will soon be begun.

An extension of the Guerneville Branch will shortly be built, running from Guerneville into the redwood forest.

Savannah, Florida & Western.—It is reported that this company has bought the East Georgia & Florida road, which has been under construction as a competing short line to Florida.

Southern Central.—The statement to the New York Commission for the quarter ending Sept. 30 is as follows:

	1886	1885.	Inc. or Dec.	P.c.
Earnings	$123,187	$149,598	D. $26,411	17.6
Expenses	88,147	150,583	D. 62,446	41.3
Net earnings	$35,040	*$995	I. $36,035	...

* Deficit.

The fixed charges this year amounted to $53,239, leaving a deficit of $18,199 for the quarter.

Southern Pacific.—On the extension of the Northern Division trains are now running to the Paso Robles Hot Springs, 73 miles south by east from the late terminus at Soledad. Track is laid to Crocker, 14 miles further, and trains will shortly run to that point, which is a new town situated on the Santa Margarita Ranch. It is expected that trains will run through to San Luis Obispo before the close of the year.

Southern Pacific Co.—This company gives notice that on Nov. 14 the California & Oregon Extension was opened to traffic to McCloud, Cal., 309.18 miles from San Francisco, *via* Davis. The stations and distances from Delta (the old terminus) are: Gibson, 7.22; Welch, 12.82; Castle Creek, 18.52; Lower Soda Springs, 21.42; Chestnut, 23.72; Dunsmuir, 25.32; Upper Soda Springs, 26.42; McCloud, 36.82 miles. The station now called Welch was formerly known as Hazel Creek.

Taylor, Elgin & Bastrop.—Tracklaying on this road is reported finished from Taylor, Tex., southward to Elgin, 17 miles, and the work is being pushed from Elgin to Bastrop, 19 miles further. The road is controlled by the Missouri Pacific, and it is said that the road will be extended from Bastrop to Houston.

Utica & Unadilla Valley.—Several meetings have been held in Utica, N. Y., to arrange for the building of a railroad from that city to Bridgewater, and thence through the Unadilla Valley to New Berlin, a distance of about 36 miles. The line, if built, would be intended for local business, and chiefly for the purpose of bringing back to Utica a considerable local business, which, it is claimed, has been diverted to other cities on account of more direct railroad connections.

Wabash, St. Louis & Pacific.—Arguments on the application for separate receivers for the Chicago Division and the other lines east of the Mississippi were concluded in the

United States Circuit Court in Chicago Nov. 13. The Court took the matter under consideration, Judge Gresham remarking that, in any case, the Purchasing Committee would be compelled to fulfill the terms of their bid for the property and pay into the court the $4,000,000 required to satisfy the receivers' indebtedness.

It is stated that a majority of the Chicago Division bondholders have acceded to the plan proposed by the Purchasing Committee, and as far as they are concerned have withdrawn their application for separate receivers. The minority, however, have refused to accede and on their behalf the application was continued.

Assents to the proposed scaling of the interest on the old first and second mortgages of the Wabash have been received by the Purchasing Committee from the holders of more than $10,000,000 of bonds. The committee has received signatures for nearly $3,000,000 of the bonds on the Chicago division, which is more than a majority of those bonds, and it is supposed that the suit for a separate receiver of that division would not be pressed. The committee has modified its plan so as to require the funding of only three instead of four past-due coupons, the other coupon to be provided for in cash.

The suit for the appointment of receivers for all the lines east of the Mississippi was argued last week at Chicago.

ANNUAL REPORTS

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Cin., Richmond & Ft. Wayne	652	Oregon & Transcontinental Co	553
Cin. & Springfield	208	Pacific Mail Steamship Co.	518
Cin., Wash & Baltimore	518	Panama	307
Cleve., Akron & Col	636	Pennsylvania Company	651
Cleveland & Canton	192	Pennsylvania & New York	222
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Cleve., Lorain & Wheeling	588	Peoria, Decatur & Evansville	195
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Detroit, Gd. Ha. & Mil.	324, 518, 749	Rome, Wat. & Ogdensburg	85
Dublin & Wrightsville	255	Rutland	493
East St. L. & Carondelet	651	St. Jo. & Grand Island	734
East Tennessee, Va. & Ga.	595, 622	St. L., Alton & Terre Haute	588
Eliz., Lex. & Big Sandy	734	St. L., Iron Mt. & So.	307
Erie & Pittsburgh	651	St. L. & San Francisco	192, 343, 360
Evansville & Terre Haute	734	St. L., Van. & Terre Haute	292
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Housatonic	192	Texas & New Orleans	770
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Huntingdon & Broad Top Mt.	120	Traverse City	652
Illinois Central	174	Troy & Greenfield	223
Indiana, Bloom. & Western	750	Union Pacific	239, 666
Indianapolis & St. Louis	208	Utica & Black River	272
Indianapolis & Vincennes	652	Vicksburg & Meridian	622
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Jeff., Madison & Indianapolis	652	Western Maryland	139
Kans. City, Ft. Scott & Gulf	486	Western North Carolina	192
Kans. City, Springfield & Mem.	485	Western Union Telegraph Co.	714
Kansas City Union Depot Co.	256	West Jersey	622
Kentucky Central	770	Wheeling & Lake Erie	698
Lake Shore & Mich. So.	23, 343, 344	Wilmington, Col. & Augusta	104
Lawrence	651	Wilmington & Northern	652
Lehigh Coal & Navigation Co.	140	Wilmington & Weldon	104
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Leh. & Wilkes-Barre Coal Co.	139	Worcester, Nashua & Roch.	196
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Little Rock & Ft. Smith	595		

Oregon Railway & Navigation Co.

The report of this company for the year ending June 30 last is received too late for an extended notice this week. A brief summary of the financial statement is as follows :

	1885-86.	1884-85	Inc. or Dec.	P. c.
Earnings	$5,546,542	$4,082,118	I. $1,464,424	35.9
Expenses	2,982,053	2,512,602	I. 469,451	18.7
Net earnings	$2,564,489	$1,569,516	I. $994,973	63.4
Other income	5,223	138,903	D. 133,680	96.2
Total net	$2,569,712	$1,708,419	I. 861,293	50.4
Charges	967,738	859,099	I. 108,639	12.7
Dividends	1,560,000	1,080,000	I. 480,000	44.4
Total	$2,527,738	$1,939,099	I. $588,639	30.4
Surplus	$41,974	*$230,680	I. $272,654	

*Deficit.

Expenditures for permanent improvements last year were $52,106, or $10,132 more than the surplus. The dividends paid were 6¼ per cent., against 4½ per cent. in the previous year.

Boston & Providence.

This company owns a line from Boston to Providence, 44 miles, all double track; the West Roxbury Branch, 5.37; the Dedham Branch, 2.22; the Stoughton Branch, 4.11, and the India Point Branch, 8.05 miles. It leases the Attleboro Branch, 4 miles, making 63.75 miles owned and 67.75 miles worked.

The 51st annual report of the company covers the year ending Sept. 30, 1886.

The equipment includes 58 locomotives; 158 passenger and 25 baggage, mail and express cars; 520 freight cars and 417 other cars. This is an average of 0.86 locomotive, 2.70 passenger-train cars and 7.68 freight cars per mile of road worked.

The general balance sheet is as follows :

Capital stock		$4,000,000
Bonds (7 per cent.) due 1893		700,000
Notes payable		260,000
Unpaid dividends		1,796
Dividend No. 100, due Nov. 1, 1886		180,000
Balances due other roads, etc		116,012
Profit and loss		490,338
Total		$4,548,146
Construction and equipment	$4,898,174	
Providence, Warren & Bristol stock	158,340	
Union Freight R. R. stock	79,015	
Cash	26,249	
Notes receivable	96,500	
Materials on hand	92,065	
Balances due from other roads, etc	196,803	
		4,548,146

The bonds are plain bonds, not secured by mortgage. The notes payable bear 4 per cent. interest and are due, $100,000 in 1888; $100,000 in 1889, and $60,000 in 1891.

The earnings for the year were as follows:

	1885-86.	1884-85.	Increase.	P. c.
Passengers	$1,084,014	$1,009,275	$74,739	7.4
Freight	622,375	593,217	29,158	4.9
Mail and express	54,815	52,720	2,095	4.0
Rents	23,601	21,854	1,747	8.0
Total	$1,784,805	$1,677,066	$107,739	6.4
Expenses	1,384,926	1,295,739	89,187	6.9
Net earnings	$399,879	$381,327	$18,552	4.9
Gross earn. per mile	26,344	24,754	1,590	6.4
Net " "	5,902	5,628	274	4.9
Per cent. of exps	77.6	77.3	0.3	....

Expenses include rents ($11,727 last year) and taxes, which were $98,389 last year and $93,742 in the previous year. Deducting taxes and rentals, the expenses were 71.4 per cent. of the gross earnings.

The result of the year was as follows :

Net earnings as above		$399,879
Balance of interest account	$21,715	
Dividends paid, 8½ per cent	340,000	
		361,715
Balance, surplus for the year		$38,164
Balance from previous year		452,174
Total surplus, Oct. 1, 1886		$490,338

No addition was made to construction accounts, all improvements being charged to expenses.

The balance of interest account above is obtained by deducting all interest and dividends received from interest paid.

The traffic reported for the year is as follows :

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Total train miles	1,018,432	1,027,688	I. 20,744	2.0
Passengers carried	6,119,906	5,612,410	I. 507,496	9.0
Passenger miles	57,900,699	54,917,134	I. 3,043,565	5.5
Tons freight carried	750,220	709,853	I. 40,367	5.7

The equipment was increased during the year by 1 locomotive, 8 passenger, 17 freight and 25 other cars.

During the year two dangerous grade crossings were done away with by carrying the highways over the track at a cost of $38,218.

Expenses were increased about $33,000 for repairs made necessary by the great freshet of Feb. 12 and 13 last. From historical records, it appears that there had been no similar freshet in the section traversed by this road since 1699, a period of 187 years.

The new station at Highland has been completed, and work has been begun on a new building at Highland.

The directors' report says: "No progress has been made in regard to terminal facilities in Providence, but it is hoped that by some arrangement with the Providence & Worcester Railroad the engine-houses of both roads may be moved into the suburbs, thereby simplifying any future plans, in the city proper, that may be proposed.

"For a long time there has been before the management the propriety of doubling the track on the West Roxbury Branch, and later to double-track the full circuit from Forest Hills to Readville. For over a year attempts had been made to obtain leave to rebuild the present highway bridge at Dedham, a most unsightly and dangerous structure (dangerous in case of fire), and without which improvement no plans could be carried out. The new bridge near the Dedham station, an important storage place for suburban service, by the consent of the town authorities and County Commissioners, is now under way. Some signatures will commemorate the fact that the work on the bridge began in the year which witnessed the 250th anniversary of the founding of the town.

"The bridges over Mother Brook and at the Bussey crossing will next have to be doubled. The work must progress slowly and by degrees."

Baltimore & Ohio.

At the close of its 60th fiscal year on Sept. 30 last this company operated directly the following lines, owned or leased :

	Miles.
Main Stem, Baltimore to Wheeling	379.0
Camden, Locust Point and other short branches	31.5
Valley Branch, Harper's Ferry to Harrisonburg	101.0
Metropolitan Branch, Point of Rocks to Washington	43.0
Fairmont, Morgantown & Pittsburgh	25.5
South Branch	16.0
Total Main Stem and branches	596.0
Washington Branch, Relay House to Washington	31.0
Parkersburg Branch, Grafton to Parkersburg	105.4
Central Ohio Div., Bellaire to Columbus	137.3
Lake Erie Div., Newark to Sandusky	116.2
Chicago Division, Chicago Junction to Chicago	271.0
Wheeling & Pittsburgh Division	65.8
Newark, Somerset & Straitsville	43.4
Pittsburgh Division, Cumberland to Pittsburgh	146.5
" " shorter branches	52.3
" " Somerset & Cambria	45.1
	243.9
Total	1,610.0
Philadelphia Division (not fully opened)	111.6
Total mileage, Sept. 30	1,721.6

The portion of the Philadelphia Division operated last year was the branch of 20 miles from Wilmington to Landenburg. The main line of 91.6 miles from Baltimore to Philadelphia was not opened for traffic until Oct. 19, after the close of the year.

In addition to the above lines, the company controls and operates the Washington County road, from Weverton to Hagerstown, Md., 24.3 miles, and the Valley road, from Harrisonburg to Lexington, Va., 62 miles. The operations of those lines are not included in the report below.

The new construction during the year was confined to the Philadelphia Division.

The company controls the Pittsburgh & Western road west of Pittsburgh, but does not lease or operate that line.

The following statements are from President Robert Garrett's report as presented at the annual meeting on Monday of this week :

FINANCIAL CONDITION.

"The profit and loss account shows an increase for the past fiscal year of $232,845. It will be seen by this account that the surplus fund, which represents invested capital derived from net earnings, and which is not represented by either stock or bonds, now amounts to $48,047,461.

"The payments for investments on account of the sinking funds for the redemption of the sterling loans due in 1895, 1902, 1910 and 1927, during the year amounted to $642,600, which at $4.84 per pound sterling make £132,768.

"In accordance with the agreement with the city of Baltimore, the eleventh annual payment, namely, $40,000, of the principal of the bond given for the purchase of the interest of the city in the Pittsburgh & Connellsville Railroad, has been made, thus reducing this obligation to $560,000.

"The following statement shows the payments made and the increments in sinking funds during the fiscal year for account of the respective debts :

Increments of sinking Funds for the redemption of the sterling loans due in 1895, 1902 and 1910	$588,392
Payment on account of the principal of debt to the city of Baltimore for the purchase of its interest in the Pittsburgh & Connellsville	40,000
Pittsburgh & Connellsville sinking fund	29,914
Baltimore & Ohio & Chicago sinking fund	54,208
Washington City & Point Lookout sinking fund	6,225
Total	$718,739

"The following shows the aggregate of payments made on account of the principal, and the investments for sinking funds on account of the debts stated, namely :

Mortgage loan redeemable in 1880	$122,000
Mortgage loan, redeemable in 1885	790,000
Bonds of the Northwestern Virginia Co. for $500,000, indorsed by the Baltimore & Ohio Co., payable in 1885	300,000
Loan of the city of Baltimore	2,425,000
Sterling loan, redeemable in 1895	2,162,795
Sterling loan, redeemable in 1902	2,742,894
Sterling loan, redeemable in 1910	1,538,229
Sterling loan, for the Baltimore & Ohio & Chicago, redeemable in 1927	416,240
Purchase of the interest of the city of Baltimore in the Pittsburgh & Connellsville Railroad	440,000
Sinking fund of the Pittsburgh & Connellsville Co.	259,956
Sinking fund of the Baltimore, Washington & Alexandria Branch of the Washington City & Point Lookout	61,564
Total	$11,318,607

"A semi-annual cash dividend of 5 per cent. upon the capital stock was paid on Nov. 2, 1885, and of 4 per cent. on May 17, 1886."

EARNINGS.

The earnings of the entire system for the year were :

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Tonnage	$14,146,073	$12,825,715	I. $1,320,358	10.3
Passengers	4,276,364	3,790,927	I. 485,437	12.8
Total	$18,422,437	$16,616,642	I. $1,805,795	10.8
Expenses	12,035,742	10,973,585	I. 1,062,157	9.7
Net earnings	$6,386,695	$5,643,057	I. $743,638	13.2
Gross earn. per mile	11,302	10,321	I. 980	9.6
Net " "	3,918	3,505	I. 413	11.8
Per cent. of exps	65.33	66.03	D. 0.70	....

"The aggregate earnings, working expenses and net results of the Main Stem (including the Winchester & Potomac, Winchester & Strasburg, the Strasburg & Harrisonburg, the Metropolitan Branch, the Washington City & Point Lookout, the Fairmont, Morgantown & Pittsburgh and South Branch Railroad); of the Washington Branch and the Parkersburg Branch; of the Central Ohio; Lake Erie; Pittsburgh; Chicago; Philadelphia; and Wheeling & Pittsburgh Division; and of the Newark, Somerset & Straitsville Railroad for the fiscal year were :

	Earnings.	Expenses.	Net earnings.
Main Stem and branches	$9,846,613	$5,820,247	$4,026,366
Washington Branch	325,321	90,815	234,506
Parkersburg Branch	663,044	501,697	161,347
Central Ohio Division	1,270,476	791,953	478,523
Lake Erie Division	1,013,014	703,302	309,711
Chicago Division	2,098,567	1,828,651	269,916
Pittsburgh Division	2,430,085	1,587,664	842,421
Wheeling & Pittsburgh Division	446,257	432,809	13,450
Philadelphia Division	114,767	99,521	15,246
Newark, Somerset & Straitsville	214,291	179,083	35,208
Working expenses, 65.33 per cent	$18,422,437	$12,035,742	$6,386,695

"The net earnings of the Chicago Division, of the Wheeling & Pittsburgh Division, and of the Philadelphia Division have been credited to the accounts for interest of those companies.

"On the Washington Branch, the expenditures charged, according to the system explained in previous annual reports, amount to $90,815, being for improvements and for repairs of railway, depots, water stations and bridges, and for pumping water. The partial expenditures charged being deducted from the revenue stated, the sum of $234,506 remains, an increase of net earnings, compared with the preceding year, of $39,734. The expenditures upon the Washington Branch show a decrease, compared with the preceding year, of $29,721. In order to make this branch as perfect as possible, important improvements continue to be made, particularly in the substitution of stone for gravel ballast. It is designed to make the road free from dust, and to perfect it in every practicable form. Semi-annual dividends of 5 per cent. upon the capital stock were paid on Nov. 2, 1885, and on April 21, 1886."

The earnings per mile of the several divisions were as follows :

	Gross.	Net.	P.c. of exps
Main Stem and branches	$16,521	$6,756	59.1
Washington Branch	10,494	7,565	27.9
Parkersburg Branch	6,291	1,531	75.7
Central Ohio Division	9,253	3,486	62.3
Lake Erie Division	8,718	2,665	69.4
Chicago Division	7,744	996	87.1
Pittsburgh Division	9,963	3,454	65.3
Wheeling & Pitts. Div	6,782	201	97.0
Philadelphia Div	5,738	762	86.7
Newark, Som. & Straitsville	4,938	811	83.6

The Philadelphia Division earnings were on the 20 miles (branch) from Wilmington to Landenburg.

THE MAIN STEM.

"Statement of the earnings and working expenses for the fiscal years 1884, 1885 and 1886, including the Winchester & Potomac, the Winchester & Strasburg, the Strasburg & Harrisonburg, the Metropolitan Branch, the Washington City &

Point Lookout, the Fairmont, Morgantown & Pittsburgh, and the South Branch Railroads.

	1884.	1885	1886
Earnings	$11,506 958	$9,733,252	$9,816,613
Expenses.			
General expenses	$202,032	$203,392	$205,232
Losses by accidents, etc	48,340	31,356	71,863
Expenses of transportation	2,740 304	2,720 081	2,509,036
Repairs of railway	785,768	691,163	680,052
Repairs of water stations	18.075	14,955	18,889
Repairs and construction of depots	180.877	161,251	210,2 7
Repairs of bridges	46,767	71,551	86,368
Repairs of telegraph lines	162,398	165,582	35,826
Repairs of stationary machinery	104 413	79 517	70,928
Watching cuts	33,353	32,433	39,024
Watching tunnels	5,101	4,500	4,362
Watching bridges	19,526	16,702	12,810
Pumping water	29,498	30,014	7,261
Repairs of locomotives	580,038	475,205	479,858
Repairs of passenger cars	280,230	202,849	282,741
Repairs of burden cars	582,461	416,225	609,680
Cleaning engines and cars	9 ,950	92,062	102,701
Contingent expenses of the Machinery Department	7,779	8,475	12,273
Fuel	324,239	323,431	341,025
Preparing fuel and filling tenders	21,468	22,560	20,151
Total expenses	$6,269,216	$5,763.352	$5 820,247
Earnings more than exps	$5,237.742	$3,969 909	$4,026,366
Working expenses	54.48 p. c.	59.21 p. c.	59.10 p. c.

"It is shown that the earnings of the Main Stem and the branches stated, in comparison with the fiscal year 1885, have increased $113,361 and the working expenses have increased $56,895, making a comparative increase of the net profits of $56,465.

"The expenses of working and keeping the roads and machinery in repair amounted to $5,820,247, being 59.10 per cent. upon the earnings, showing a decrease of 0.11 per per cent. compared with the previous year."

TRAFFIC.

The traffic statements given in the report are as follows:

	1885-86.	1884-85.	Inc. or Dec.	P.c.
Tons through freight	2,731,119	2,398 147	I 392,972	16.8
Bbl. flour to Baltimore	752,150	766,163	I. 14,013	1 8
Bu. wheat "	3,437,159	3.200,025	I. 237,134	7.4
Bu. corn "	9,474,275	8.383,359	I. 1,090.916	13 0
Bu. all grain "	13,718,428	14,048,258	I. 670,170	5.1
Tons lumber "	92.831	86,560	I. 6,271	7.2
Tons live-stock carried	70,220	67,890	I. 2,330	3.4
Coal tonnage:				
Main Stem	3,673,448	3,487,170	I. 183,278	5.3
Pittsburgh Division	2,427,238	2 003,982	I. 423,256	21.1
Trans Ohio lines	1,329 681	909,594	I. 420,087	46.2
Total tons coal	7,430,367	6,400.716	I 1,029,621	16.1

Of the Main Stem coal tonnage 489,361 tons were for the use of the company on its various lines. Coke is included in coal. The increase in the Main Stem was made in spite of a large decrease in the Cumberland trade. The gain on the Trans-Ohio lines is notable.

The tonnage of through merchandise East and West has been:

	Tons.		Tons.
1871	435 207	1879	1,425.629
1872	557,609	1880	1,980,397
1874	640,265	1881	2 014,110
1874	752,256	1882	2,043,207
1875	872.101	1883	2,108,325
1876	1,093.393	1884	2,275,252
1877	1,017,645	1885	2,338,147
1878	1,149,499	1886	2,731,119

The through tonnage last year was thus over 6¼ times that of 1871. This tonnage has shown a continuous increase for 16 years past.

The report gives the following general summary for the year:

ROAD AND EQUIPMENT.

"All the tracks of the Main Stem and of nearly all the branches east of the Ohio River are now laid with steel rails. The increased cost of steel substituted for iron rails has been uniformly charged to the repair account.

"The condition of the road-bed, tracks and engines has been maintained at a high standard. A large number of new sleeping coaches, parlor and thoroughfare cars have been added, replete with every modern improvement and convenience.

"Twenty engines have been built at the company's shops, 3 have been rebuilt, 2 have been purchased and 5 have been withdrawn from the service. Of the 25 engines built, rebuilt and purchased, 20, being new and additional plant, have been charged to rolling power, and 5, to replace that number withdrawn, have been charged to the repair account.

"There have been 1,213 cars built and rebuilt at Mount Clare and other shops of the company, and 30 oil tank cars have been purchased. Of this number of 1,243 cars, 714, being new and additional plant, have been charged to rolling power, and 529, to replace that number withdrawn and destroyed, have been charged to the repair account. There have been 510 cars arranged for the coke trade, 1,131 cars have received thorough repairs and 358 cars have been repainted.

THE PHILADELPHIA DIVISION.

"The line between Baltimore and Philadelphia was opened for passenger and freight traffic on Oct. 19. The road is strictly first class, being laid with steel rails and stone ballasted. Commodious passenger stations and freight warehouses have been erected at many points, and at Newark and Wilmington, Delaware, and Chester, Pennsylvania, handsome passenger stations of stone and brick are being built. At Twenty-fourth and Chestnut streets, Philadelphia, the main station is in course of erection. The structure will be substantial, ornate and complete in all its appointments. The principal offices of the division will also be located in the main station. The Schuylkill River East Side Railroad, in the city of Philadelphia, is the connecting link between the Philadelphia line and the system of the Philadelphia & Reading Railroad Co. The work on this part of the route has necessarily been difficult and tedious, but its completion is anticipated in the month of December, when passengers from New York will be carried, without change of cars, to Baltimore, Washington and all points on the system of the Baltimore & Ohio Co. The Delaware Branch Railroad, extending from a point on the line of the Schuylkill River East Side Railroad, is also nearing completion. By this branch the principal docks and large manufacturing establishments on the Delaware River will be reached.

BALTIMORE & OHIO TELEGRAPH.

"The increase in the earnings of the Baltimore & Ohio Telegraph Co. for the fiscal year ended Sept. 30 has been 172 per cent. compared with 1884, and 41.25 per cent. compared with 1885. In the midst of acute competition, the large and increasing patronage thus commanded demonstrates the strength of the company and the value and efficiency of its service. The fact that the Telegraph Co., in addition to its value in facilitating the varied business operations of the Railroad Co., has not only paid to that company the agreed annual rental for the use of the wires on its railroads not needed for railroad purposes, but has also shown a satisfactory net earning capacity, fully vindicates the wisdom of the board in establishing its telegraph system. The poles and wires of the entire system have been maintained and improved during the year, and extensions continue to be made from time to time to meet the requirements of the public and the growing business of the company.

RELIEF ASSOCIATION.

"The Baltimore & Ohio Employés Relief Association continues to prosper and to grow in popularity with the men in the service. Its membership now numbers 20,297, an increase of 4,001 over last year. The disbursements to the members during the year amounted to $217,704, making an aggregate of disbursements since the inauguration of the Association on May 1, 1880, of $1,245,156.

"The savings and building features as their workings become known are receiving higher appreciation. There have been 653 new accounts opened in the savings bank during the year. The deposits during the year amounted to $209,790, making a grand total since the inauguration of these features on Aug. 1, 1882, of $506,401. Of this amount $151,004 has been withdrawn by depositors, and $306,363 has been loaned at a low rate of interest to such employés as desired to construct, purchase or improve homesteads upon the company's lines.

"The pension feature continues to prove valuable as a reward to employés for long and faithful services. Thirty-one additional names have been placed on the roll during the year, and 14 deaths have occurred. In all, 138 men now receive benefits from the pension fund.

PORT OF BALTIMORE.

"The river and harbor bill of August, 1886, contained an appropriation of $150,000 for continuing the work of widening the channel to the port of Baltimore to 400 ft., and dredging, which had been suspended for want of funds since June 30, 1885, has been resumed under the charge of Lieut.-Colonel W. P. Craighill, of the United States Engineer Department. It is estimated that $80,000 will complete the undertaking, and this sum Congress will be asked to appropriate at its next session. The port of Baltimore will therefore soon have a channel of a uniform width of 400 ft., with a present depth of 27 ft. at mean low tide. The commanding value of this port for the large sections and communities which avail of it for exports and imports, and the necessity for a greater width of channel for the vessels of large tonnage which now come to Baltimore, will doubtless cause Congress an at early day to appropriate sufficient funds to widen the channel to 600 ft. As the material through which it has been excavated has been soft and yielding, the cost of the work will be quite small compared with the advantages and economies to be gained by having a channel of a uniform width of 600 ft.

CONCLUSION.

"The board express with pleasure their continued appreciation of the successful management of the business of the company through the faithfulness and efficiency of the officers and employés in all departments of the service."

Central Railroad & Banking Co. of Georgia.

The following statements are from advance sheets of President Raoul's report for the fiscal year ending Aug. 31 last. The lines worked during the year were as follows:

Central Railroad:	Miles.
Savannah, Ga., to Macon	192.0
Gordon to Eatonton	39 0
Augusta Branch, Millen to Augusta	53.0
Total Savannah Division	284 0
Atlanta Division, Macon to Atlanta	102.5
Southwestern Railroad, Macon, Ga., to Eufaula, Ala., and branches	320.0
Total Central R. R	706 5
Eufaula & Clayton R. R	20.5
Montgomery & Eufaula	80.0
Columbus & Western, Columbus, Ga., to Goodwater, Ala	89.0
Total	896.0

The company also owns the Savannah, Griffin & North Alabama road, 63 miles; one-half interest in the Western, of Alabama, 138 miles; a controlling interest in the Port Royal & Western Carolina, 335 miles; controlling interests in the Mobile & Girard, 84 miles, and the Upson County road, 16½ miles. These roads do not appear in the report. The Mobile & Girard has lately been leased, as noted below.

The company wholly owns the Ocean Steamship Co., whose lines run between Savannah and New York, and the Central Railroad Bank, which is organized under its charter.

Of the road worked, as stated above, the company owns directly the line from Savannah to Macon and the Atlanta Division, 294.5 miles. The Eatonton Branch, the Augusta Branch (Augusta & Savannah road) and the Southwestern road are leased. The company owns the chief interest in the Southwestern road, and its bonds are issued under a joint mortgage covering that road as well as its own.

The company holds one-half interest in the lease of the Georgia Railroad, 443 miles; the other half being owned by the Louisville & Nashville Co.

The car equipment of the lines worked includes 127 passenger-train cars; 1,312 box, 104 stock, 401 flat, 46 coal and 47 caboose cars; 32 road or service cars.

The earnings of the company's railroad lines were as follows:

	Earnings.	Expenses.	Net earn.
Savannah Division	$1,806,563	$938.887	$867,676
Atlanta Division	582.870	383,119	199,751
Southwestern R. R	975,719	730,232	245,487
Total Central R. R	$3,365.152	$2,052,238	$1,312,914
Columbus & Western	173.208	121,080	52,128
Mont. & Eufaula	2?9.690	152,887	146,803
Eufaula & Clayton	23,276	18,558	4,718
Total	$3,861,326	$2,344,763	$1,516 563
Total, 1884-85	3,771,449	2,571,348	1,200,101
Increase or decrease	I. $89,877	D $226.585	I. $316,462
Per cent	2.4	8.8	26.4

The large increase in net earnings was chiefly due to the general reduction in working expenses.

The earnings per mile, and the percentage of expenses to gross earnings on the several lines were:

	Earn. per mile		Net per mile		P. c. of exps.	
	1885-6.	1884-5.	1885-6.	1884-5.	1885-6	1884-5
Savannah Div	$6.361	$6,276	$2.055	$2,385	52.0	62.0
Atlanta Div	5.687	5,315	1.949	1,783	65.7	77.7
S. W. R	3.049	2 960	767	616	74.8	79.2
Total Cent. R R.	$4.763	$4,635	$1,858	$1,469	61.0	69 6
Col. & Western	1 946	1.943	589	607	69.9	68.9
Mont. & Eufaula	3.746	3 746	1,835	1,766	51.0	52.8
Eufaula & Clayton	1,136	1,197	230	451	79.7	62.4
Total	$4.310	$4 212	$1,693	$1.340	66.6	68.2

The effects of competition are shown by the Atlanta Division, which formerly had heavier earnings per mile than the Savannah Division, but has now fallen much below.

The total income of the company was as follows:

	Earnings	Expenses.	Net earnings.
Railroad lines	$3,861,326	$2,344.763	$1,516,563
Ocean Steamship Co.			442,159
Central R. R. Bank	55.667	19.446	36,221
Total	$3,916,993	$2,364,209	$1,994 943
Total, 1884-85	3,911,507	2,566,961	1,807,627
Increase or decrease	I. $5,486	D. $202,752	I. $187,316
Per cent	0.1	7 9	10.4

In this statement only the net earnings of the Ocean Steamship Co. are given in both years. Interest and dividends received on investments are included in the Bank earnings. The increase in the Steamship Co. net earnings was $63,251, or 16.7 per cent.

The Central Railroad shows a surplus over fixed charges of $279,177; the Montgomery & Eufaula, $41,892; the Eufaula & Clayton, $4,718, and the Ocean Steamship Co., $282,939. The Columbus & Western shows a deficit in meeting fixed charges of $14,872.

The result of the year was as follows:

Net earnings, as shown above		$1,994,943
Interest on bonds	$566 220	
" " certificates of indebtedness	276,000	
Sinking funds	115,000	
Rental of leased lines	443,958	
Deficit on dividend, previous year	7 ,266	
State taxes, Southwestern R. R. judgment	41.127	
Deficit on Georgia R. R. lease	44,815	
Year's proportion of cost of change of gauge	54,500	
		1 613,886
Balance, surplus for the year		$381,057
Dividends, 4 per cent		299.956
Balance		$81,101

"At the writing of the last report the hope was entertained that the Georgia Railroad would, in the near future, sufficiently increase its earnings to justify the retention of the balance against it on the books as a solvent asset, but the failure to earn that portion of rental for which the company is responsible, for the year closing March 31, by $44,814, prompts the more peculant policy of the charging of the old balance to profit and loss and, beginning with this year, include any losses or gains that may hereafter occur in the annual account of earnings and expenses. Up to this date its business exhibits an improvement for the present fiscal year as compared with the same months of the preceding year.

"The net earnings of the Columbus & Western were practically the same as the year preceding. The determination of the Kansas City, Fort Scott & Gulf Co. to extend its road eastward from Memphis to Birmingham, decided the company carrying out its original plan of extension in the purchase of the Columbus & Western and build to Birmingham to meet the Kansas City. An engineer corps is now in the field locating the undetermined portion of the road and the construction of that portion immediately beyond Goodwater, already located and practically graded, has been commenced. It is hoped to have the road completed to Birmingham in about one year from this time. This connection with Kansas City, the centre of the most important producing region of the Northwest, not only opens to this section of the country traversed by the company's existing lines the cheapest channel through which to draw its products, but also affords the shortest mileage route from that same region to New York and other eastern cities. It is confidently believed that an improvement in revenues of railroads and steamship property will follow close upon the completion of this connection.

President Raoul's report says: "The increase in net earnings would have warranted, and a larger dividend would have been declared, but for the unavoidable concentration in this year's operations of the large amount of charges of an extraordinary character, as shown in the foregoing statement of disbursements, and the underestimate made for the earnings of three months succeeding the declaration of the dividend. * * *

"The gauge of the track from Savannah to Atlanta was changed from 5 ft. to 4 ft. 9 in. on Tuesday, June 1, and a like change made in all your other lines during the few days preceding and following that date. Half the engines and cars were changed during the two months preceding, and the remainder since that time. It was a work of considerable magnitude, and required for its safe and successful completion, a carefulness in planning, and an accuracy in arrangements for carrying out the multiplicity of details involved in it, that necessarily placed great anxiety upon those charged with the responsibility of its execution.

"It is a pleasure to your board to be able to announce it a gratifying success, the credit for which is entirely due to the superintendents, the heads of the several departments concerned, and those serving under them, all of whom performed their duties with an energy and devotion meriting the highest commendation.

"The cost of this work, so far as it could be eliminated from operating expenses, was $218,000. As indicated in the last report, it is proposed to distribute the liquidation of this account over several years, and with this policy in view, $54,500 is charged off, as shown in the statement of disbursements.

tion. Recognizing its importance, it is proposed to build and equip the line in a thorough manner.

"The net earnings of the Montgomery & Eufaula have slightly increased over the preceding year, and, as shown by the tabulated statement, is $46,802.26, which is equivalent to its fixed charges, and about 6½ per cent. on its capital stock.

"The net earnings for the Eufaula & Clayton for the past year amounted to $47,821, which is about 4.7 per cent. on its nominal capital stock ($100,000), and about 1½ per cent. on the capital it would take to construct the road.

"The operations of the Ocean Steamship Co. have been increased over last year.

"A lease of the Mobile & Girard Railroad was consummated for the period of 99 years from June 1. The leading conditions are that the company is to pay this interest on its bonded debt now amounting to $208,000, and permit no increase of the same, and $1.50 per share upon the capital stock then outstanding. The capital stock consists of 12,684 shares of stock at a par value of $100 per share, of which the company owns 4,455 shares. As the road has been operated for many years past in friendly co-operation with the company, and the company is already an indorser upon its outstanding bonds, the change is to a certain extent nominal. The road has met its interest for several years and is now in excellent condition, and little doubt is entertained that economy is to be secured by operating it under its lease, and thus dispensing with some of the expense of the separate organizations, will enable it to meet this slight additional obligation. The lease obviates the possibility of the road being operated otherwise than as a feeder to the Central.

"It was deemed advisable to render financial assistance to parties constructing roads in upper South Carolina, reaching Spartanburg, Greenville and Anderson, connecting with the Augusta & Knoxville road, as they would, under a management working in harmony with the company, become very important contributors to the tonnage of both its roads and ships. The money required to render this aid was partly secured by the sale of some securities held in treasury and not needed for the control of other property, and partly by temporary loans. Arrangements have been effected to continue the indebtedness thus contracted in its present shape till it can be funded in the securities of the new companies, which will be consummated at no distant day. To accomplish this, and to meet the expense of change of gauge, without encroaching upon the net earnings, involved an increase of the floating debt which, though large, is amply protected by additional property with this satisfactory plan in view for funding the entire debt in securities of self-sustaining property."